September 1992

Idaho National Engineering Laboratory

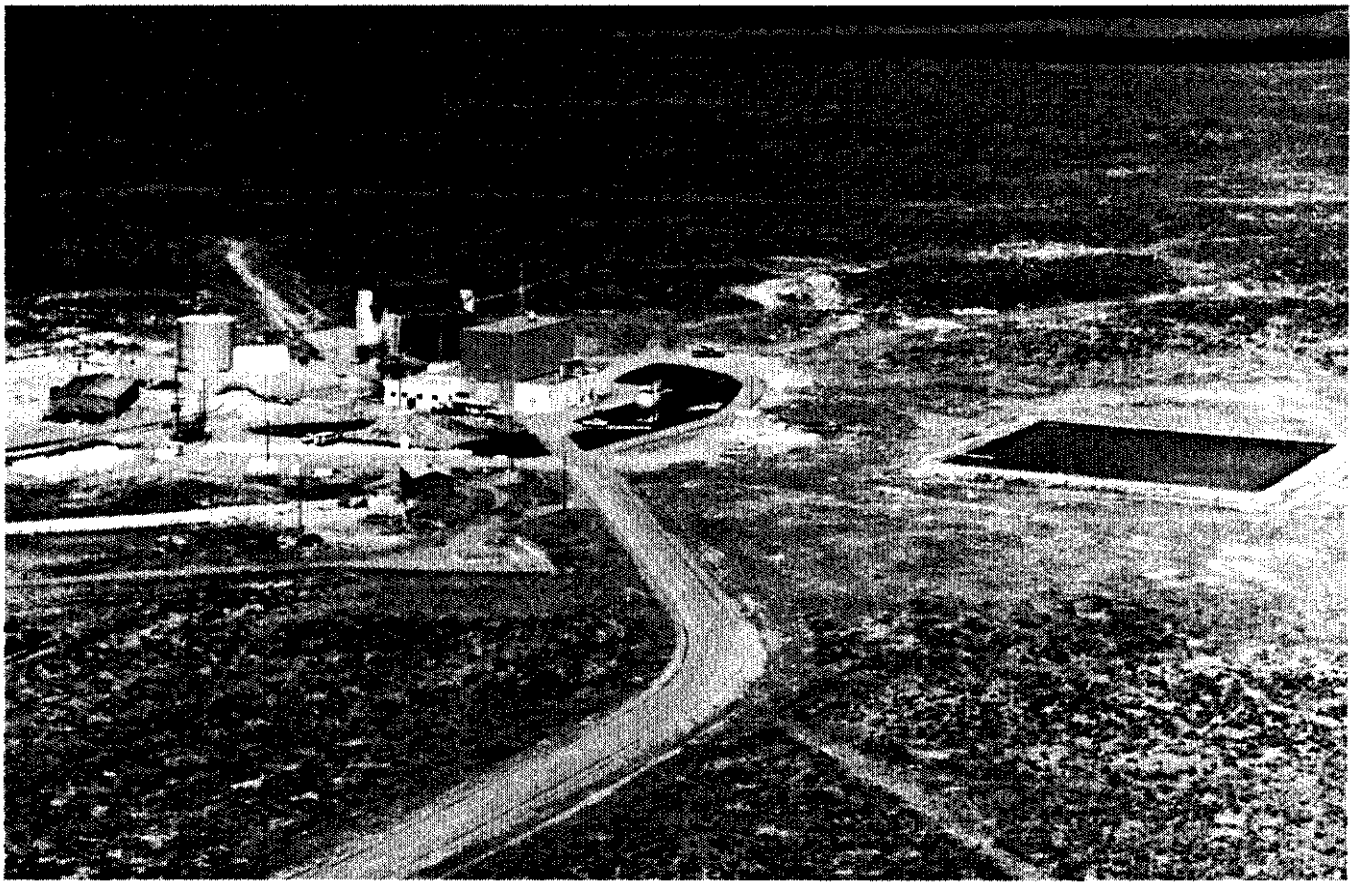
IDAHO DEPARTMENT OF HEALTH AND WELFARE

DIVISION OF ENVIRONMENTAL QUALITY

Power Burst Facility Record of Decision

Power Burst Facility Corrosive Waste Sump and Evaporation Pond

Operable Unit 5-13
Waste Area Group 5
Idaho National Engineering Laboratory
Idaho Falls, Idaho



Power Burst Facility Reactor Area at the Idaho National Engineering Laboratory

DECLARATION OF THE RECORD OF DECISION

Site Name and Location

Power Burst Facility Corrosive Waste Sump and Evaporation Pond
Operable Unit 5-13
Waste Area Group 5
Idaho National Engineering Laboratory
Idaho Falls, Idaho

Statement of Basis and Purpose

This decision document presents the selected interim remedial action for the Power Burst Facility (PBF) Evaporation Pond, Corrosive Waste Sump, and discharge pipe at the Idaho National Engineering Laboratory (INEL), Operable Unit (OU) 5-13. This alternative was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act, and to the extent practicable the National Oil and Hazardous Substances Pollution Contingency Plan. This decision is based on information in the Administrative Record for the site, which is located in the DOE Public Reading Room at the INEL Technical Library, 1776 Science Center Drive, Idaho Falls, Idaho.

The lead agency in this decision is the U.S. Department of Energy. The U.S. Environmental Protection Agency approves of this decision and, along with the Idaho Department of Health and Welfare (IDHW), has participated in the evaluation of the interim action alternatives. The IDHW concurs with the selected remedy.

Assessment of the Site

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to human health and welfare or the environment due to the presence of chromium in the Evaporation Pond sediments.

Description of the Selected Remedy

This ROD for OU 5-13 addresses the contamination of the sediments of the Evaporation Pond and the sludge and sediment contained within the Corrosive Waste Sump and discharge pipe at the PBF. This interim remedial action involves:

- The removal of the identified areas of high contaminant concentration in the Evaporation Pond
- Stabilization of contaminated material from the pond by grouting and disposal at the Radioactive Waste Management Complex (RWMC) at the INEL
- Removal of the sludge and sediment present within the Corrosive Waste Sump
- Treatment of materials and sediments removed from the sump by grouting, if feasible based on treatability studies, and disposal at the RWMC

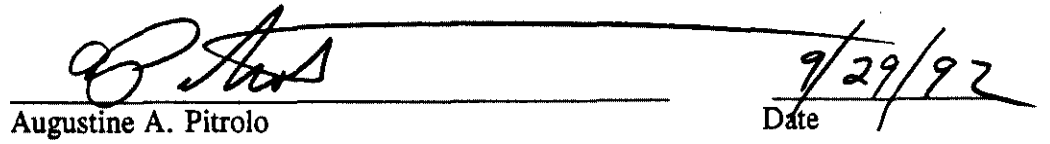
Removing the areas of high contaminant concentration reduces the potential risk to human health by reducing the potential for exposure to chromium by inhalation and cesium-137 by direct ionizing radiation. Cleanup levels which have been determined to be protective of human health for this remedial action are 800 mg/kg for total chromium and 30 pCi/g for cesium-137. Cesium-137 does not present an unacceptable risk, but will be used as an indicator for chromium during the interim action. All contaminant concentrations above these levels will be removed from the pond.

Declaration

This interim action is protective of human health and the environment. It complies with federal and state applicable or relevant and appropriate requirements directly associated with this interim action and is cost-effective. This interim action is not intended to fully address the statutory mandate for permanence and treatment to the maximum extent practicable. It does, however, use treatment, and is in furtherance of that mandate by utilizing permanent solutions and alternative treatment technology to the maximum extent practicable given the limited scope of this action. As mandated by CERCLA, a review will be conducted within 5 years to assess the risk remaining at the site.

Because this action may not constitute the final remedy for the Evaporation Pond, Corrosive Waste Sump, and discharge pipe, the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as the principal element will be addressed at the time of the final response action. Subsequent actions may be necessary to fully address the principal threats posed by the site. Because the interim remedy will result in some contaminants remaining onsite, the effectiveness of the interim action as a final action will be evaluated in the Waste Area Group 5 Comprehensive Remedial Investigation/Feasibility Study (OU 5-12), scheduled to begin in 1996.

Signature sheet for the foregoing Record of Decision for Operable Unit 5-13 interim action at the Idaho National Engineering Laboratory between the United States Department of Energy and the United States Environmental Protection Agency, with concurrence by the Idaho Department of Health and Welfare. The Operable Unit 5-13 interim action consists of cleanup of the Power Burst Facility Evaporation Pond, Corrosive Waste Sump, and discharge pipe at the Idaho National Engineering Laboratory.



9/29/92

Augustine A. Pitrolo
Manager
Department of Energy Idaho Field Office

Date

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Dana Rasmussen
Regional Administrator, Region 10
Environmental Protection Agency

Date

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Richard Donovan
Director
Idaho Department of Health and Welfare

9/30/92
Date

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TABLES

ACRONYMS

ARARs	applicable or relevant and appropriate requirements
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COCA	Consent Order and Compliance Agreement
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
FFA/CO	Federal Facility Agreement and Consent Order
FR	Federal Register
HWMA	Hazardous Waste Management Act - State of Idaho
IDHW	Idaho Department of Health and Welfare
INEL	Idaho National Engineering Laboratory
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NESHAP	National Emission Standards for Hazardous Air Pollutants
NPL	National Priorities List
OU	Operable Unit
PBF	Power Burst Facility
pCi/g	picocuries per gram
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RWMC	Radioactive Waste Management Complex
SARA	Superfund Amendments and Reauthorization Act
TRA	Test Reactor Area
WAG	Waste Area Group

DECISION SUMMARY

1. SITE NAME, LOCATION, AND DESCRIPTION

The Idaho National Engineering Laboratory (INEL) is located in southeastern Idaho on the northeast portion of the Eastern Snake River Plain and encompasses approximately 890 square miles of desert. The closest major community is Idaho Falls (population 46,000), located 42 miles southeast of the INEL. The Power Burst Facility (PBF) is located in the south-central portion of the INEL (Figure 1). This Record of Decision (ROD) documents the interim action decision for the PBF Evaporation Pond, Corrosive Waste Sump, and discharge pipe [Operable Unit (OU) 5-13], which are located within the PBF area, east of the Reactor Building (PBF-620) (Figure 2).

The PBF Corrosive Waste Sump is an unlined concrete structure that was used during the neutralization of spent reactor secondary coolant water prior to discharge to the Evaporation Pond. The Corrosive Waste Sump dimensions are 11 x 11 x 21 ft deep. The sump walls are 12 in. thick, and the floor is 15 in. thick. The discharge pipe (approximately 6 in. in diameter) that leads from the Corrosive Waste Sump to the Evaporation Pond may also be contaminated.

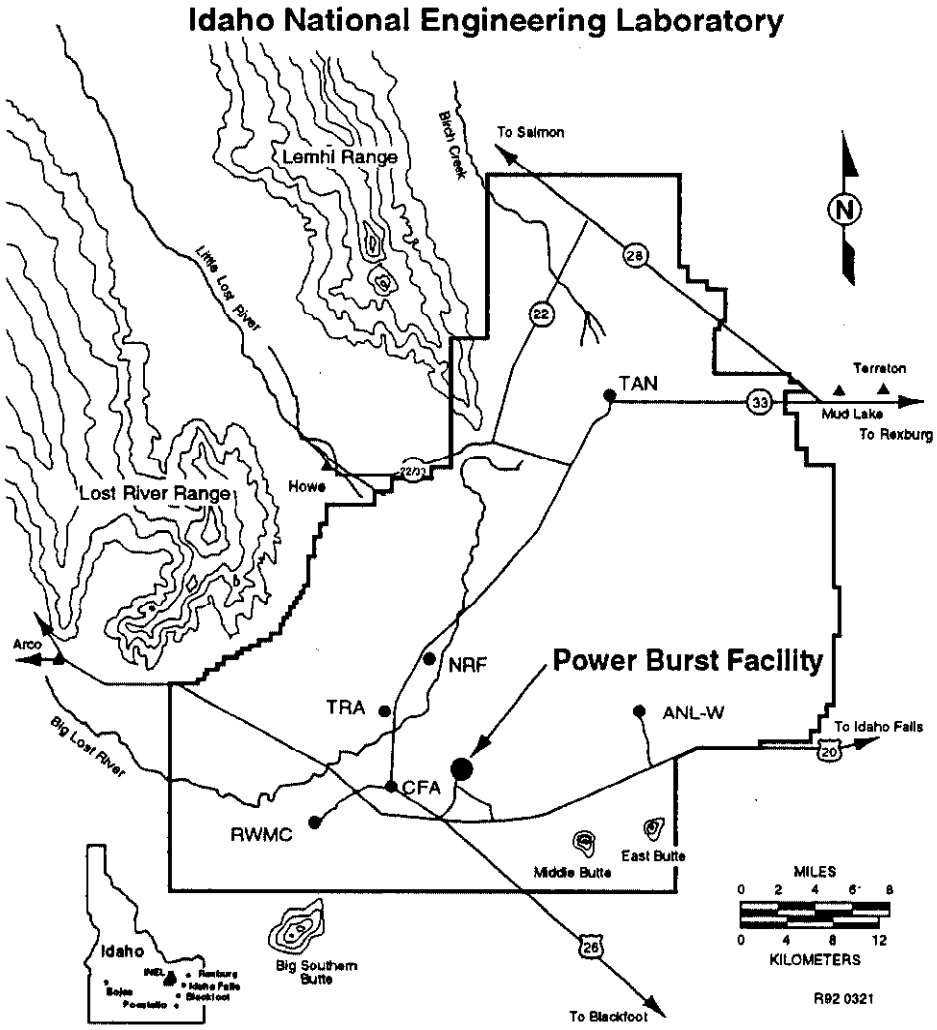

Figure 1. Location of INEL and PBF facilities

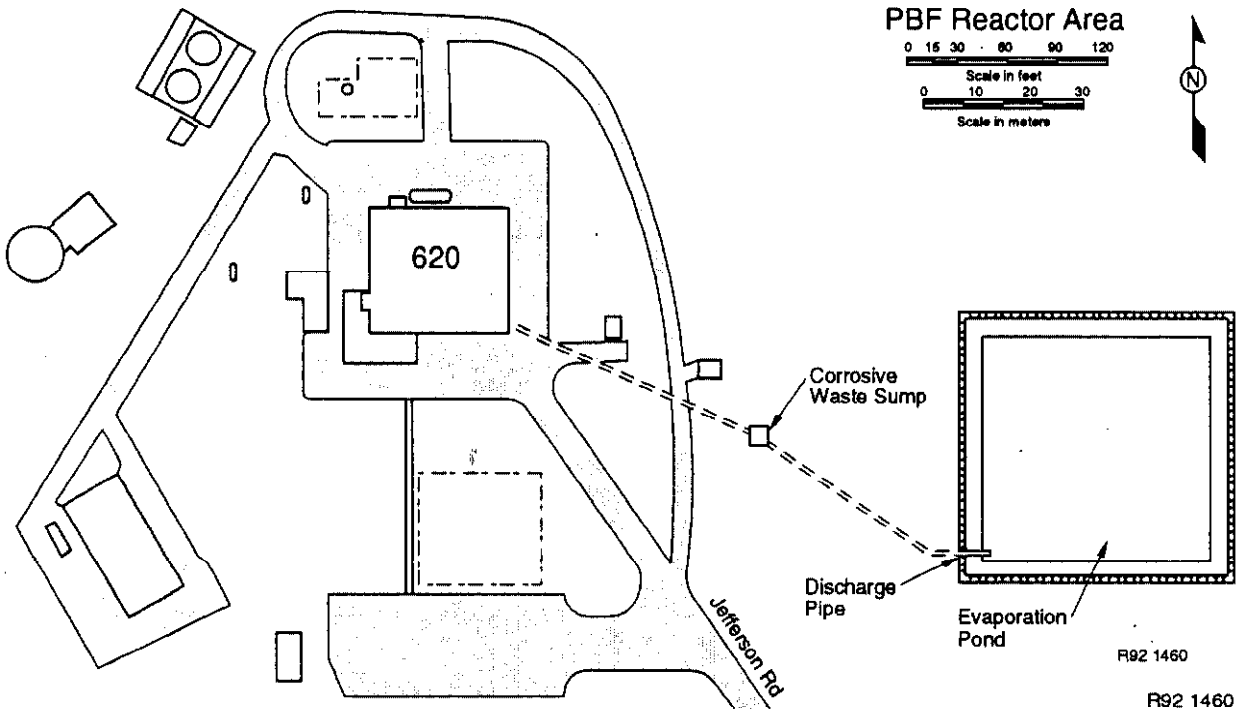

Figure 2. Map of the PBF Reactor Area showing OU 5-13: the PBF Corrosive Waste Sump (PBF-8) and Evaporation Pond (PBF-10)

The PBF Evaporation Pond is a 140- x 140-ft lined surface impoundment enclosed by a 6-ft high cyclone fence. The pond is used to receive reactor secondary cooling water from the PBF reactor following neutralization in the Corrosive Waste Sump. The Evaporation Pond was constructed in 1978 by borrowing native soil from a source located east of the pond. This material was used to form a 4.5-ft high berm containing a Hypalon liner, which was covered by 6 in. of sediments for protection.

2. SITE HISTORY AND ENFORCEMENT ACTIVITIES

The PBF reactor, which operated from 1972 to 1985, was built to support the Thermal Fuel Behavior Program's testing of pressurized-water reactor fuel rods under hypothetical reactor accidents. The discharge from the regeneration of the demineralizers and secondary coolant system waste was released to the Corrosive Waste Injection Well (OU 5-08) from 1972 to 1978. From 1978 to 1984, water containing a chromium-based algal and corrosion inhibitor from the PBF reactor's secondary coolant system was discharged into the Evaporation Pond via the Corrosive Waste Sump, along with discharges associated with the regeneration of demineralizers. In 1984, a phosphate-based corrosion inhibitor replaced the chromium-based inhibitor, thereby eliminating further discharge of chromium.

The Corrosive Waste Sump and discharge piping from the Waste Sump to the Evaporation Pond are part of a system whose prime function was to transfer secondary coolant water from the PBF secondary coolant system to the Evaporation Pond. The secondary coolant system was drained 2 to 4 times per year when the reactor was operational. To prevent discharge of toxic hexavalent chromium to the Corrosive Waste Sump, the secondary coolant water was treated by bubbling sulfur dioxide through it to reduce the hexavalent chromium to less toxic trivalent chromium. The coolant was discharged to the Corrosive Waste Sump, where the liquid was neutralized using sodium hydroxide or sulfuric acid. The pH of the sump effluent was monitored for only a short period in late 1984 and was normally between 6.5 and 7.0. Because the process did not change, these results are assumed to be representative of all effluent discharged through the sump.

The Corrosive Waste Sump also received water from the demineralizer system. The demineralizer system contains ion exchange resin columns that were used for purifying primary and secondary reactor cooling water and for treatment of wastewater. After the majority of the exchange capacity is used, the resin, which is in the form of beads, is regenerated.

During regeneration of the resin columns, backflushing operations allowed some resin beads to flow to the Corrosive Waste Sump and then to the Evaporation Pond. Because ion exchange resin beads selectively bind to metal ions such as chromium and cesium-137, the highest concentrations of chromium and cesium-137 would most likely occur in areas of the pond where the resin beads accumulate. Results from sampling done in 1989 support the concept that chromium and cesium-137 are associated as mentioned above.

As a result of the evaporation of secondary coolant water discharged to the pond, chromium and cesium-137 contamination is found in the 9,800 cubic feet (363 cubic yards) of sediments located on top of the Hypalon liner. The INEL's waste management records indicate, on the average, a total of 33 lb/yr trivalent chromium was discharged to the Evaporation Pond. There is no leak detection system under the liner, and no samples have been collected from beneath the liner to determine if leakage and subsequent contamination of the sediments beneath the liner have occurred. However, the pond does retain water, which has been introduced to control the emission of particulate material.

The PBF Evaporation Pond sediments have been sampled several times. In 1988, six random grab samples were collected from the Evaporation Pond. Chemical analyses were performed to quantify the types and concentrations of metals, volatile organics, semi-volatiles, pesticides, and polychlorinated biphenyls present. In September 1989, six biased grab samples were collected from the Evaporation Pond and analyzed for the presence of gamma-emitting radionuclides. A combination of biased and systematic random samples (a total of 20 samples) were collected to characterize the pond and sump contents in November of 1989. The laboratory data from these sampling efforts and the preliminary risk evaluation based on those data, provide the basis for this interim action.

The release of radioactive or hazardous contaminants to the Evaporation Pond was identified and evaluated during investigations conducted in accordance with the Resource Conservation and Recovery Act (RCRA) Corrective Action Requirements of the July 1987 Consent Order and Compliance Agreement (COCA) signed by the U.S. Environmental Protection Agency (EPA), U.S. Department of Energy (DOE), and U.S. Geological Survey. The sump and pond were listed as COCA units PBF-08 and PBF-10, respectively, in that agreement.

Under the COCA, the pond and sump were listed as RCRA Land Disposal Units because there was information indicating wastewater exhibiting the toxicity characteristics for chromium was discharged to the pond after the effective date of the relevant RCRA regulations. These units have since been incorporated into the Federal Facility Agreement and Consent Order (FFA/CO) and are being addressed under the CERCLA process. The 1989 EP Toxicity tests show Evaporation Pond sediments do not exhibit the toxicity characteristic for chromium, and therefore are not RCRA hazardous. The material in the Corrosive Waste Sump has not been subjected to a toxicity characteristic leach test. However, much lower concentrations of contaminants were detected in the waste sump. These low concentrations in a medium consisting mostly of resin beads, which aggressively binds chromium and other metal ions, indicates that the sump materials are not RCRA hazardous waste. Consistent with the FFA/CO Action Plan, Section 1.3.1, the final action for this OU will meet the applicable substantive requirements of RCRA/Hazardous Waste Management Act - State of Idaho (HWMA) in the event an unacceptable risk to human health and the environment is demonstrated.

The INEL was proposed for listing on the National Priorities List (NPL) in the *Federal Register* (*FR*) on July 14, 1989 (54 *FR* 29820). The listing was proposed by the EPA under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). The final rule, which listed the INEL on the NPL, was

published on November 21, 1989, in 54 *FR* 44184.

In December 1991, the EPA, DOE, and Idaho Department of Health and Welfare (IDHW) signed the FFA/CO that superseded the COCA. This agreement provides the process and schedule to facilitate cleanup of the areas identified in the FFA/CO Action Plan, in accordance with CERCLA, RCRA, and HWMA.

The FFA/CO lists OU 5-13 as an interim action requiring investigation and/or remediation. This ROD documents the decision to perform an interim action on OU 5-13 and the remedy selected. The OU 5-13 interim action will be evaluated for adequacy as a final remedial action in the Waste Area Group (WAG) 5 Comprehensive Remedial Investigation/Feasibility Study (RI/FS), which is scheduled to begin in 1996.

3. HIGHLIGHTS OF COMMUNITY PARTICIPATION

In accordance with CERCLA, sections 113(k)(2)(B)(i-v) and 117, the public was given the opportunity to participate in the remedy selection process. In accordance with CERCLA, section 113(k)(1), an Administrative Record was established to provide the basis for the selection of the remedial action. The Notice of Availability for the Proposed Plan was published in the *Post Register* (Idaho Falls), *Idaho State Journal* (Pocatello), and *Times News* (Twin Falls) on April 3, 1992; in the *Idaho Statesman* (Boise) and *Daily News* (Moscow) on March 21; and in the *South Idaho Press* (Burley) on March 27 and April 3.

Public involvement opportunities for the PBF OU 5-13 Interim Action were announced via the *INEL News* newsletter, which is distributed to approximately 14,000 members of the general public. Newspaper and radio advertisements and an INEL press release were utilized to inform the public of this proposed action. Personal phone calls were made to key individuals, environmental groups, and organizations by the INEL outreach offices in Pocatello, Twin Falls, and Boise and by the Community Relations office in Idaho Falls. The Proposed Plan for the interim action for the PBF Evaporation Pond and the PBF Corrosive Waste Sump was mailed to the public on March 19, 1992. The Proposed Plan was mailed to approximately 6,500 individuals on the INEL mailing list with a cover letter from the Director of the Environmental Restoration Division of the DOE, Idaho Field Office, urging citizens to comment on the Proposed Plan and to attend public meetings. Copies of the Proposed Plan and the Administrative Record are available to the public in six regional INEL information repositories: the INEL Technical Library in Idaho Falls; and city libraries in Idaho Falls, Pocatello, Twin Falls, and Boise; and the University of Idaho Library in Moscow. The city library in Moscow originally received the material, but the material has since been moved to the University of Idaho Library. Copies of the Administrative Record file for the PBF Evaporation Pond and Corrosive Waste Sump Interim Action were placed in the information repositories sections or at the reference desk in each of the libraries on March 19, 1992.

The public comment period was initially scheduled from March 25 to April 24, 1992. Two public meetings were held on April 8 and 9, 1992, in Idaho Falls and Burley, respectively. Representatives from the DOE, IDHW, and EG&G Idaho, were present to discuss the Proposed Plan, answer questions, and receive public comment. The EPA was available via teleconference to assist in answering questions and receiving comments. Verbatim transcripts were prepared by a court reporter at each public meeting. Written comment forms were also available at each meeting. A telephone technical briefing was held for the League of Women Voters and other citizens of Moscow on May 7, 1992, at the University of Idaho Education Building.

During the initial comment period a written request was received for an extension, and the public comment period was extended an additional 30 days, to May 24. The reason for the requested extension was the delay in some of the public receiving the Proposed Plan due to mailing problems. The extension announcement was made in the *Post Register* on April 24, the *Idaho State Journal* on April 26, the *Times News* on April 26, the *Idaho Statesman* on April 27, the *Daily News* on April 24, the *South Idaho Press* on April 24, and the *Morning Tribune* (Lewiston) on April 26.

All verbal comments given at the public meetings and all submitted written comments are recorded verbatim in the Administrative Record for the ROD. Responses to the public comments received during the public comment period are included in the Responsiveness Summary (Appendix A) and were considered during the development of this ROD. Public comments on the Proposed Plan are annotated to indicate which response in the Responsiveness Summary addresses each comment. The information used as the basis of the decision for this interim action is included in the Administrative Record.

Predominant public opinions on the preferred alternative, as described in the Proposed Plan, are that any potentially contaminated sediments beneath the pond should be removed, in addition to removal of all the sediments within the pond and the liner itself. Others who believe the risk to human health and the environment is minimal, suggested the "No Action" alternative should be implemented.

4. SCOPE AND ROLE OF OPERABLE UNIT AND RESPONSE ACTION

To better manage the investigations needed to determine appropriate remedial actions, the INEL has been divided into 10 WAGs. Within each WAG, known or suspected areas of contamination are assigned to an OU as a means of managing and controlling investigation and cleanup activity. This strategy allows the EPA, IDHW, and DOE to focus available cleanup resources on those areas that could potentially pose a risk to human health and the environment. WAG 5 consists of the PBF and the Auxiliary Reactor Area. The PBF Evaporation Pond sediments, Corrosive Waste Sump, and connecting discharge pipe are identified as OU 5-13. The underlying aquifer and unsaturated zone are not included in this OU but will be addressed in a subsequent investigation.

Existing characterization data were available to identify OU 5-13 as a risk to human health and the environment due to the presence of chromium and to support selection of a remedial technology. This interim action is intended to reduce immediate unacceptable risks associated with the Evaporation Pond sediments and to remove and dispose of the contaminants contained in the Corrosive Waste Sump to expedite overall INEL cleanup. On the basis of the characterization data available in the Administrative Record for the sediments of the PBF Evaporation Pond, an immediate unacceptable risk to human health has been identified due to potential receptor inhalation of chromium. No exposure pathway exists that poses an unacceptable risk to human health and the environment from contaminants contained within the Corrosive Waste Sump and discharge pipe. However, the pipe and sump are being cleaned up under this action to eliminate a potential future source of contamination to the pond sediments. The interim action will not be inconsistent with any known future CERCLA actions.

As mandated by CERCLA, a review will be conducted within 5 years to reassess potential risk from this OU. This review will only consider the effectiveness of the protective measures employed, by an evaluation of actions and verification data to date. The interim action will be evaluated for adequacy as a final remedial action as part of the WAG 5 Comprehensive RI/FS (OU 5-12), scheduled to begin in 1996.

5. SUMMARY OF SITE CHARACTERISTICS

To more definitively characterize materials contained within the PBF Evaporation Pond and Corrosive Waste Sump, biased and random sediment samples were collected in 1989 and documented in the *Closure Plan for the Power Burst Facility Corrosive Waste Sump and the Power Burst Facility Evaporation Pond (COCA units PBF-08 and PBF-10)*, EGG-WM-8996, May 1990. The regulatory status was changed from RCRA to CERCLA in 1991 by the signing of the FFA/CO. Data from samples collected in 1989 were used to support CERCLA site characterization. Analyses for the presence of gamma-emitting radionuclides and metals were performed on the samples collected from the Evaporation Pond sediments (Table 1). Chromium (total) and cesium-137 were the contaminants of concern identified in the toxicity screen performed on the Evaporation Pond sediments. Average total chromium concentration of the random samples in the PBF Pond is 500 mg/kg, with the maximum

concentration (3,439 mg/kg) of total chromium occurring in a biased sample located near the pond inlet. Because hexavalent chromium was chemically reduced prior to discharge, all the chromium in the sump and pond is assumed to be trivalent chromium. The highest concentration of cesium-137 (325 pCi/g) was from a biased sample near the pond inlet, with an average of 20.3 pCi/g from all random samples collected throughout the pond. Figure 3 is a diagram of the PBF Evaporation Pond, indicating sample locations and contaminant concentrations.

In addition to sampling the waste disposal areas, undisturbed areas upwind of the Corrosive Waste Sump and the Evaporation Pond were sampled to characterize background metal levels. The purpose of the background samples was to have a point of comparison for the samples collected in the pond. Background samples indicated the surrounding soils have a mean total chromium concentration of 21 mg/kg, which is attributable to natural occurring chromium. These background samples were well within the range of background chromium concentrations reported at other locations on the INEL.

The results of the PBF Corrosive Waste Sump sampling indicated the presence of low-level radioactivity (6.97 to 7.86 pCi/g of cesium-137). In addition, compounds found only in the sump were the volatile organic compounds 4-methyl-2-pentanone (150.0 to 170.0 µg/kg), ethylbenzene (5.0 to 16.0 µg/kg), and xylene (32.0 to 100.0 µg/kg).

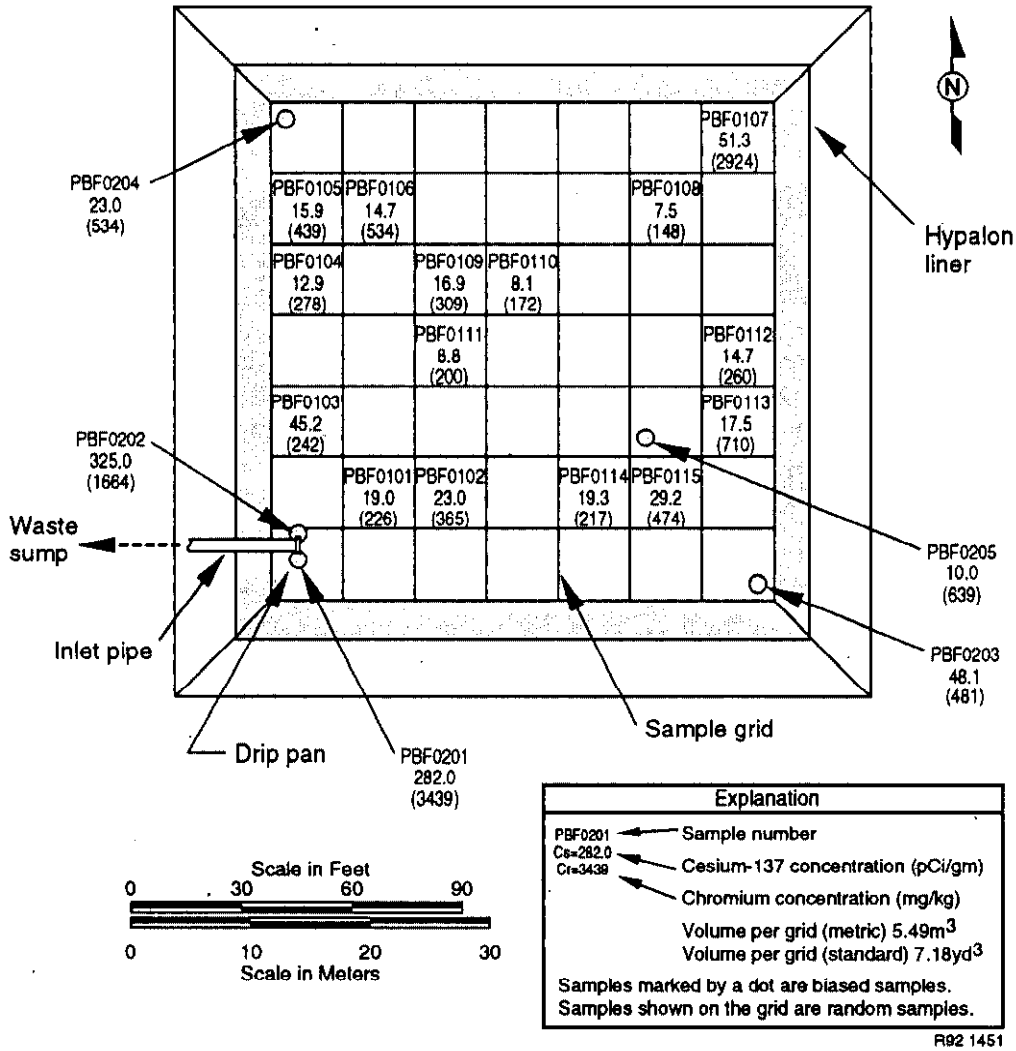

Figure 3. Sample locations and contaminant concentrations collected during the 1989 sampling effort at the PBF Evaporation Pond.

6. SUMMARY OF SITE RISKS

6.1 Human Health Risk

A preliminary risk evaluation was performed in accordance with EPA guidance to determine the risks to human health posed by contaminants identified in the Evaporation Pond sediments, and is available in the Administrative Record. The contaminants identified in the sump (a closed concrete vault) were not considered for this preliminary evaluation because it is unlikely these contaminants have a pathway to receptors (since the contaminants are contained) and because of the small volume of waste material in the sump. However, the sump and discharge pipe materials are to be removed to eliminate future contamination of the pond sediments.

Table 1. Cesium-137 and chromium concentrations found in PBF Evaporation Pond samples.

Sample No.	Sample Location	Cesium-137 pCi/g	Chromium (mg/kg)	Sediment Depth cm (ft)
PBF0101M	Random	19.0	226	12.2
PBF0102M	Random	23.0	365	11.6
PBF0103M	Random	45.2	242	13.4
PBF0104M	Random	12.9	278	14.0
PBF0105M	Random	15.9	439	14.0
PBF0106M	Random	14.7	534	13.1
PBF0107M	Random	51.3	2924	12.8
PBF0108M	Random	7.5	148	14.9
PBF0109M	Random	16.9	309	9.5
PBF0110M	Random	8.1	172	12.8
PBF0111M	Random	8.6	200	12.2
PBF0112M	Random	14.7	260	11.9
PBF0113M	Random	17.5	710	15.2
PBF0114M	Random	19.3	217	10.1
PBF0115M	Random	29.2	474	11.7
Random Sample Average		20.3	500	12.5
PBF0201M	Biased	282.0	3439	8.5
PBF0202M	Biased	325.0	1664	9.8
PBF0203M	Biased	48.1	481	20.1
PBF0204M	Biased	23.0	534	20.4
PBF0205M	Biased	10.0	639	16.2
Average of all Samples		50.0	713	13.2 (0.43)

In the preliminary risk evaluation, the potential for carcinogenic and noncarcinogenic toxic effects was computed using EPA default parameters and methods found in the *Risk Assessment Guidance for Superfund*, Volume I, "Human Health Evaluation Manual." The default model parameters may be more conservative than site-specific parameters but are routinely applied.

Occupational and future residential scenarios were examined to assess the risks to humans from exposure to the contaminants in the Evaporation Pond sediments. The pathways by which workers or future residents could be potentially exposed to the contaminants within the pond were identified as inhalation, ingestion, direct contact, and direct radiation. The risks from the groundwater pathway were not included in this risk evaluation because OU 5-13 is confined to the sediments overlying the Hypalon liner. The aquifer and unsaturated zone in this area will be evaluated in another investigation within WAG 5.

Of the four exposure pathways identified, inhalation of fugitive dust and direct exposure to ionizing radiation were the greatest contributors to risk. The inhalation pathway of chromium presented an excessive hazard quotient, and direct exposure to ionizing radiation contributed to an excess in the incidence of cancer. For both of these pathways, future residential risk was the highest. The future residential use scenario is based on an individual beginning future residence at the pond site 100 years in the future. One hundred years was agreed to by the three agencies involved for use in evaluating future residential scenarios.

For present day workers (occupational) and future residents, the risk due to the inhalation of existing levels of chromium-contaminated dust were both calculated and found to exceed the EPA hazard quotient of 1 (Table 2). This result implies sensitive sub-populations may exhibit adverse health effects due to their exposure to fugitive dust emissions from the pond.

Additionally, exposure to direct ionizing radiation, due to the presence of cesium-137, was found to be within the acceptable risk range defined in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) as 10^{-4} to 10^{-6} for occupational and residential populations. The calculated value for present day workers is 8 additional cancer incidences in 100,000 exposed workers, and for future residents the calculated value for excess cancer incidences is 4 additional incidences of cancer per 10,000 exposed individuals residing near the pond 100 years in the future. The NCP, 40 CFR 300.430, establishes the point of departure for determining remedial goals as 1 in 1,000,000 (10^{-6}) for carcinogens. For cesium-137, a 10^{-6} risk corresponds to a concentration of 0.66 pCi/g.

Cleanup goals for the PBF Evaporation Pond sediments are based on a site-specific residential use scenario for a population that begins residence at the site 100 years in the future. This scenario results in the calculation of a conservative cleanup level protective of current occupational and future residential populations at the PBF. The cleanup goal for chromium is 800 mg/kg. This level was established using equations from the *Risk Assessment Guidance for Superfund*, Part A (EPA 1989), and site-specific exposure parameters for the residential use scenario. An inhalation rate of 20 cubic meters/d, exposure time of 350 d/yr, and a PM-10 fraction (particles of less than 10 microns) of 12.5% of the total suspended particulates were used in these calculations (*Rapid Assessment of the Exposure to Particulate Emissions from Surface Contamination Sites*, EPA/600/8-85/002, February 1985). The chromium cleanup level of 800 mg/kg results in a hazard quotient below the EPA's threshold hazard quotient and protects sensitive individuals and sub-populations from adverse health effects.

The cesium-137 cleanup goal of 30 pCi/g will ensure the high concentrations of chromium are also removed. Radioactive decay of the cesium-137, will result in a concentration of 3 pCi/g at the site 100 years in the future. This corresponds to an excess cancer risk of 5×10^{-5} at the site 100 yrs in the future. These cleanup levels were calculated using EPA-approved methods (Part B of the *Risk Assessment Guidance*).

The presence of high concentrations of chromium is the primary risk driver for this interim action. Although the risk of exposure to cesium-137 is within the acceptable risk range, these risks will also be reduced by removal of the contaminated sediments. The presence of cesium-137 will be used as an indicator for the presence of chromium.

Table 2. Summary of risk from preliminary risk assessment for the PBF Evaporation Pond.

	Carcinogenic Risk (cesium-137)	Hazard Quotient (chromium)
Ocupational	8 in 100,000 (8×10^{-5})	1.75
Future Residential (100 yr)	4 in 10,000 (4×10^{-4})	6.1

Based on 1989 sampling results, cesium-137 and total chromium concentrations display a strong spatial correlation. Figure 4 shows the spatial relationship of the two contaminants. Removing areas of high concentrations of contaminants is predicated on the observed spatial correlation between the cesium-137 and the chromium. Cleanup of higher radioactive areas, as detected by field instrumentation, will indicate a reduction in the concentration of both contaminants of concern. When the cleanup goal of 30 pCi/g for cesium-137 is attained, the cleanup goal of 800 mg/kg for total chromium is assumed to be attained also. To confirm the effectiveness of the cleanup, sampling of the remaining sediments will be performed to verify residual concentrations of cesium-137 and total chromium are at or below established cleanup levels.

6.2 Ecological Concerns

An ecological risk assessment was not performed for this interim action. Because the interim risk evaluation methodology is conservative and the major ecological exposure routes are expected to be the same as for human exposures, the risk reduction realized due to this interim action should also achieve a significant reduction in adverse ecological effects. An ecological assessment will be performed as part of the INEL-wide Comprehensive RI/FS scheduled to begin in 1998.

6.3 Basis for Response

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to human health or the environment due to the presence of chromium in the Evaporation Pond sediments.

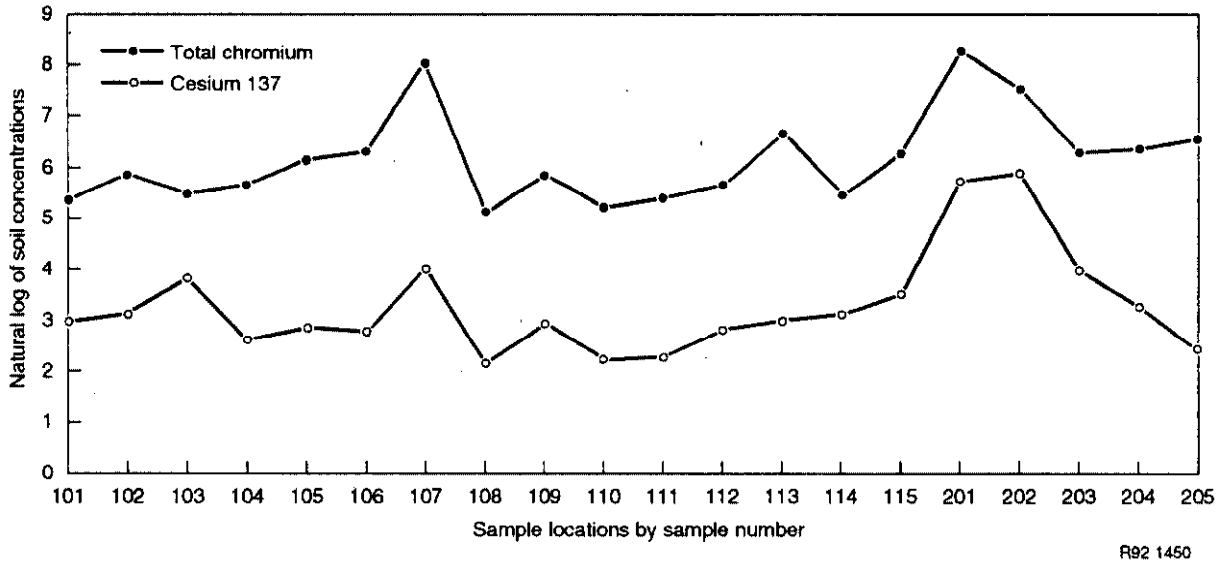

Figure 4. Spatial relationship of total chromium to cesium-137 in the PBF Evaporation Pond using log transformed data from Table 1.

7. DESCRIPTION OF ALTERNATIVES

Consistent with NCP and EPA guidance, a limited number of alternatives were evaluated for this interim action. A summary of the alternatives and controls for each alternative is provided below.

7.1 Alternative 1: No Action

If the No Action alternative is implemented, the OU would remain in its current state. This alternative does not further restrict access to the site or restrict the pathways through which the contaminants may be transported. The No Action alternative was evaluated to determine if it is a viable alternative as required by the NCP (40 CFR 300.430). No additional costs or implementation time is involved with this alternative.

7.2 Alternative 2: Removal of Areas of High Contaminant Concentration

There is a strong correlation between areas of higher radioactivity (relative to the pond) and elevated levels of chromium in the pond sediments as demonstrated by the 1989 sampling results (Figure 4). Removing the areas of high contaminant concentration reduces potential risk to human health. Removal options include but are not limited to, pneumatic lifting, manual extraction, or light mechanical extraction. Removal of extracted material will be handled prior to treatment such that exposure to direct ionizing radiation and emission of fugitive dust are minimized.

Two treatment and disposal options were proposed for the removed sediments. Option A involves treatment (separation/extraction) and disposal using the sediment washing process proposed for the Test Reactor Area (TRA) Warm Waste Pond Interim Action. Presently, treatability studies are being conducted at TRA. The major applicable or relevant and appropriate requirements (ARARs) pursuant to this option are discussed in the TRA ROD located in the Administrative Record.

Option B involves treatment (stabilization/solidification) followed by disposal at the Radioactive Waste Management Complex (RWMC). The stabilized sediments would be used to fill void spaces in existing certified low-level waste containers. Treatability studies will be conducted to determine the optimum sediment/grout/additive mixture. Major ARARs pursuant to this option are listed and discussed in Section 10.2.

During the sediment removal process, the materials located in the sump and discharge pipe will also be removed, treated, and disposed. The sump and associated discharge pipe will be decontaminated to ensure they will not be a continuing source of contamination.

8. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

CERCLA guidance requires each remedial alternative be evaluated according to specific criteria. The purpose of the evaluation is to determine the advantages and disadvantages of each alternative, thereby guiding selection of the remedial alternative offering the most effective and feasible means of achieving the stated cleanup objectives. While all nine CERCLA criteria are important, they are weighted differently in the decision making process depending on whether they describe a required level of performance (threshold criteria), technical advantages and disadvantages (balancing criteria), or review and evaluation by other entities (modifying criteria). The two remedial alternatives described in Section 7 were evaluated according to the following CERCLA criteria:

- Threshold criteria
  - Overall protection of human health and the environment
  - Compliance with ARARs

- Balancing criteria
  - Long-term effectiveness and permanence
  - Reduction of toxicity, mobility, or volume through treatment
  - Short-term effectiveness
  - Implementability
  - Cost

- Modifying criteria
  - State acceptance
  - Community acceptance.

8.1 Threshold Criteria

The remedial alternatives were evaluated in relation to the two threshold criteria: overall protection of human health and the environment and compliance with ARARs. The threshold criteria must be met by the remedial alternatives for further consideration as potential remedies for the ROD. The threshold criteria must be met for a final remedial action, and this interim action is intended to meet those criteria to the maximum extent practicable. The effectiveness of this remedial action as a final remedy will be evaluated in the WAG 5 Comprehensive RI/FS.

8.1.1 Overall Protection of Human Health and the Environment

Overall protection of human health and the environment requires evaluation of how well the remedial alternatives eliminate, reduce, or control the identified risks. This overall assessment of protection of human health and the environment draws on the assessments conducted under other evaluation criteria, especially long-term effectiveness and permanence, short-term effectiveness, and compliance with ARARs. For this interim action to be successful, present unacceptable risks will be reduced and further remedial action may be unnecessary.

The No Action alternative provides no reduction in contaminant concentrations and, therefore, does not meet the protection of human health and the environment criterion. The alternative of removing areas of high contaminant concentration from within the sediments provides protection of human health and the environment by reducing the potential for exposure by inhalation of chromium to below the threshold hazard quotient of 1. As described in Section 7.2, Option A involves treatment and disposal using the sediment washing process proposed for the TRA Warm Waste Pond. Option B involves treatment (stabilization/solidification) followed by disposal at the RWMC. Both of these options, with the necessary facilities designed and constructed, would meet protective criteria.

8.1.2 Compliance with Applicable or Relevant and Appropriate Requirements

CERCLA, as amended by SARA, requires remedial actions for Superfund sites comply with federal and state substantive requirements that are applicable to the action being taken. Remedial actions must also comply with the substantive requirements of laws and regulations that are not directly applicable, but are relevant and appropriate unless waivers are granted. These are requirements that pertain to situations sufficiently similar to those encountered at a Superfund site, so their use is well suited. Combined, these are referred to as ARARs. State ARARs are limited to those requirements that are more stringent than federal counterpart requirements. Compliance with ARARs requires evaluation of the remedial alternatives for compliance with chemical-, location-, and action-specific ARARs or justification for a waiver. Compliance also requires consideration of whether the remedial alternative considers other criteria, advisories, and guidelines.

8.2 Primary Balancing Criteria

After the proposed alternatives are evaluated using the two threshold criteria, five balancing criteria are used to evaluate other aspects of the potential remedial alternatives. Each alternative is evaluated using each of the balancing criteria. The balancing criteria are used in refining the selection of the candidate alternatives for the site. The five balancing criteria are: long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; and cost. Each criterion is further explained in the following sections. The No Action alternative did not meet the threshold criterion (protection of human health and the environment) and was not considered further.

8.2.1 Long-Term Effectiveness and Permanence

In evaluating long-term effectiveness and permanence, the magnitude of residual risks as well as the adequacy and reliability of controls must be examined. The magnitude of the remaining risks is evaluated by assessing the residual risk associated with untreated waste and the treated residual. The characteristics of the residuals should be considered to the degree that they remain hazardous, taking into account their volume, toxicity, mobility, and propensity to bioaccumulate. Adequacy and reliability of controls are evaluated by assessing the containment and/or institutional controls to determine if they are sufficient to ensure any exposure to residual risks is within protective levels.

Alternative 2, Option A (separation/extraction), reduces the risks associated with the chromium and cesium-137 in the Evaporation Pond sediments by extracting the contaminants of concern from the sediments and placing the treated residuals in a controlled environment, thereby reducing the risks associated with the Evaporation Pond sediments. The contaminated sediment could present a risk due to its radioactive content, but the material would be treated, containerized, and stored in such a way as to be directly or indirectly monitored. Final disposal would be addressed in the WAG 2 Comprehensive RI/FS.

Alternative 2, Option B (stabilization/solidification), meets the criterion for long-term effectiveness because the contaminants in the sediment are physically bound in a grout mixture, thereby reducing the residual risks associated with the Evaporation Pond sediments. The permanence of stabilization technology is unproven for the length of time needed for the highest expected concentration of cesium-137 to decay to acceptable levels consistent with the NCP. However, regardless of the performance of the grout over time, the contaminated sediments will be placed in certified low-level waste containers and disposed of in the RWMC, which is a low-level waste repository. Institutional and administrative controls are presently in place at the RWMC in accordance with the DOE Orders applicable to low-level waste storage.

8.2.2 Reduction of Toxicity, Mobility, or Volume Through Treatment

This criterion addresses the statutory preference for selecting remedial actions employing treatment technologies that permanently reduce toxicity, mobility, or volume of the hazardous substances as their principal element. Evaluating alternatives based on the reduction of toxicity, mobility, or volume through treatment requires analysis of the following factors: treatment process used, toxicity and nature of the material treated, amount of hazardous material destroyed or treated, irreversibility of the treatment, type and quantity of treatment byproducts, and statutory preference for treatment as a principal element.

The separation/extraction process (Option A) would reduce the toxicity of the sediment removed from the pond by removing the majority of the contaminants. Because the process is still in development, the total reduction in toxicity and volume is not known at the present time. The concentrated sediment portions extracted should be more toxic than initial pond sediments because of the concentrating of contaminants. However, the small volume of highly-contaminated material left after extraction would be containerized, thereby reducing mobility of the contaminants while awaiting final disposition.

Option B, stabilization/solidification, reduces the toxicity and mobility of the contaminants of concern by dispersing the contaminants in an inert (grout/sediment) matrix. Stabilization increases the volume of contaminated material due to the addition of grout, but this interim action utilizes existing container void space to allow disposal with no net increase in the volume used in the RWMC. Therefore, waste minimization principals have been considered.

8.2.3 Short-Term Effectiveness

The evaluation of alternatives based on the short-term effectiveness requires an evaluation of the effectiveness of protection for the community and workers during remedial actions, environmental impacts during implementation, and the amount of time required for remedial action objectives to be achieved. Either option would achieve the remedial action objectives in about the same amount of time. The time required to execute the action after design is completed is not anticipated to exceed one field season. During implementation of either option of Alternative 2, protection of workers from radiation exposure would be an important element of the remedial design. Because the Evaporation Pond is currently a radioactively-controlled area, all personnel entering the area must have training for working with hazardous substances, radioactive substances, and respirators. Health physics personnel will be on site at all times when work is ongoing to monitor and control radiation exposure to personnel. Every person entering the working area at the pond will wear appropriate personal protective equipment, including a dosimeter to record the radiation received. DOE has as low as reasonably achievable radiation dose goals for personnel; these goals will be met.

By using administrative and institutional controls, either option for Alternative 2 proposed for the Evaporation Pond minimizes any short-term risk to the community from this interim action. The large distances from population centers and the strict security at the PBF prevent risks to communities during implementation of this interim action. Access by visitors and site personnel not working on the project will be restricted to those meeting INEL requirements.

8.2.4 Implementability

The implementability criterion has three factors requiring evaluation: technical feasibility, administrative feasibility, and the availability of services and materials. Technical feasibility requires an evaluation of the ability to construct and operate the technology, the reliability of the technology, the ease of undertaking additional remedial action (if necessary), and monitoring considerations.

Removal of contaminated sediments as proposed by Alternative 2, is a common approach to risk reduction. Because a small volume of material is to be removed (approximately 100 cubic yards), this approach is easily implemented. The ability to coordinate actions with other agencies is a factor for evaluating administrative feasibility and is not anticipated to be a major issue for this project. The availability of services and materials requires evaluation of treatment, storage capacity, disposal services, necessary equipment and specialists, and prospective technologies.

Implementation of the treatment and disposal options at the TRA Treatment Facility (Option A) and the RWMC (Option B) varies considerably. Implementation of treatment and disposal at TRA is dependent on developing a new application of an existing technology. If the timing of the projects does not correspond, implementing the proposed TRA treatment and disposal option will be problematic. The RWMC is an existing facility, and the equipment for grouting can be acquired and assembled in a timely manner. The disposal of the stabilized waste will be in an existing facility. For these reasons, grouting (Option B) followed by disposal of the waste at the RWMC is the option most implementable.

8.2.5 Cost

In evaluating project costs, an estimation of capital costs, operation and maintenance costs, and present

worth costs are required. Capital costs include design, construction, equipment, buildings, startup, and contingency costs. Operating and maintenance costs include labor, power, disposal of residuals, administrative, and periodic review. Actual costs are expected to be no more than 50 percent over, or 30 percent under, the cost estimate. Costs for each alternative are summarized in Table 3. Alternative 1, No Action, has no cost. The total cost for Alternative 2, Option A including sediment removal and treatment would be $557,000, while Option B total cost would be $480,000 (see Table 3).

8.3 Modifying Criteria

The modifying criteria are used in the final evaluation of remedial alternatives. The two modifying criteria are state acceptance and community acceptance. For both of these criteria, the factors considered include the elements of the alternativese supported, the elements of the alternatives not supported, and the elements of the alternatives having strong opposition.

8.3.1 State Acceptance

This assessment evaluates the technical and administrative issues and concerns the state may have regarding each of the alternatives. The IDHW concurs with the interim action because it takes the contaminants of concern from an uncontrolled environment to a controlled situation. The IDHW participated in the development of this project, including preparation of the Proposed Plan and this decision document. Comments received from the state were incorporated into these documents, which have been issued with concurrence from the IDHW.

8.3.2 Community Acceptance

The public comment period, which was held from March 25 to May 24, 1992, provided the opportunity for the public to express their opinions regarding each of the remedial alternatives. Many citizens commented on the efficacy of the preferred alternative. Some suggested the agencies should remove all the pond sediments, liner, and any potential contamination present beneath the pond liner. Other members of the public believed the risk to human health and the environment to be minimal and supported the No Action alternative. Public comments on the plan were considered during the preparation of this ROD and are responded to in the attached Responsiveness Summary.

9. SELECTED REMEDY

The DOE, EPA, and IDHW selected Alternative 2, Option B (removal of areas of high contaminant concentration and grouting of the sediments for disposal at the RWMC), as the interim action for the PBF Evaporation Pond, Corrosive Waste Sump, and discharge pipe. This alternative is preferred because it is a standard, available technology that can be readily implemented at reasonable cost. The contaminated sediments will be characterized, treated by stabilization/ solidification, and disposed of at the RWMC. A treatability study will be performed to determine the optimum sediment grout additive mixture. Voids in certified low-level waste containers, which are to be disposed of in the RWMC, will be filled with the grout mixture containing the contaminated sediments. The estimated amount of contaminated sediments to be removed is approximately 100 cubic yards. The interim action of OU 5-13 will cost an estimated $480,000.

Removing the areas of high contaminant concentration will reduce the risk to human health by reducing the potential for exposure to chromium from inhalation and cesium-137 from direct ionizing radiation. The effectiveness of the interim action as a final action will be evaluated in the WAG 5 Comprehensive RI/FS, OU 5-12, scheduled to begin in 1996.

Table 3. Cost estimation for alternatives.

	Alternative	Cost
Alternative 1	No Action	$ 0
Alternative 2	**Option A**	
	Contaminanted sediment removal	$ 213,000
	Emergency discharge tank	37,000
	Sump decontamination	22,000
	Technical support	95,000
	Treatment and disposal at the TRA.	
	Warm Waste Pond	190,000
	Total Option A	**$ 557,000**
	Option B	
	Contaminated sediment removal	$ 213,000
	Emergency Discharge tank	37,000
	Sump Decontamination	22,000
	Technical support	95,000
	Treatment and disposal at the RWMC	113,000
	Total Option B	**$ 480,000**

9.1 Sump Decontamination

Sludge and sediments will be removed from the sump to eliminate future contamination to the pond sediments during future discharge events. The sump will be pumped and the sludge and sediments will be collected and sampled. The interior of the sump will be decontaminated. The interior of the sump will be analyzed for radioactivity to ensure decontamination is complete. The discharge pipe will also be decontaminated and analyzed for residual radioactivity. Treatment of materials and sediments removed from the sump will be by grouting, if feasible based on treatability studies, and disposal at the RWMC.

9.2 Contaminated Sediment Removal

Approximately 100 cubic yards of the sediments in the PBF Evaporation Pond will be removed, incorporated into a grout mixture, and injected in void spaces of existing certified low-level waste containers for disposal at the RWMC. Field screening using portable radiation detectors will be used to identify sediments to be removed. The chromium and cesium-137 concentrations correlate well in the pond sediments as demonstrated by previous sampling efforts. By using field screening, elevated concentrations of cesium-137 and corresponding areas of elevated concentrations of chromium can be identified. Verification samples will be collected to ensure the concentration of remaining chromium does not pose an unacceptable risk. Sediment samples will be taken under the liner, and any sediments contaminated above cleanup levels will be removed and disposed of as part of this action. However, since no contamination has been identified beneath the liner, none of that material was included in the estimated volume of sediments to be removed. The cleanup levels for this interim action are 800 mg/kg for chromium and 30 pCi/g for cesium-137.

A doubled lined evaporation tank will be placed on the site to receive discharges that may occur during the interim action due to an emergency situation. This tank may be used for future discharges in lieu of relining the pond.

9.3 Estimated Waste Generation and Disposal Option

Any wastes generated by removing areas of high contaminant concentration will be disposed of in accordance with laws regulating their characteristics (hazardous, radioactive). Low-level radioactive wastes will be disposed of at the RWMC on the INEL. Minimal quantities of other hazardous wastes, such as laboratory wastes, may be disposed of offsite in accordance with EPA's *Revised Procedures for Planning and Implementing Off-Site Response Actions*. Solid waste will be disposed at offsite and onsite facilities, depending on availability.

If these existing treatment, storage, and disposal facilities are inadequate or unavailable, the following option will be implemented:

- The waste would be stored on the INEL until additional disposal facilities are available

If this conditions occurs, it would be resolved as soon as possible, but no later than the WAG 5 ROD (OU 5-12).

10. STATUTORY DETERMINATIONS

Under CERCLA, the DOE and EPA have primary responsibility to ensure interim actions taken at the site reduce the immediate, identified risks to human health and the environment. Additionally, CERCLA, section 121, as amended by SARA, establishes several other statutory requirements and preferences. These specify that, when complete, the final selected remedy at each OU must implement applicable or relevant and appropriate environmental standards established under federal and state environmental laws unless a statutory waiver is justified.

The selected remedy must also be cost-effective and use permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. The remedy should represent the best balance of tradeoffs among alternatives with respect to pertinent criteria. Finally, the statute includes a preference for remedies employing treatments that permanently and significantly reduce the volume, toxicity, or mobility of hazardous wastes as their principal element. The selected remedy (removal of areas of high contaminant concentration and grouting of the sediments for disposal at the RWMC) for the interim remedial action for OU 5-13 at the INEL meets these statutory requirements.

10.1 Protection of Human Health and the Environment

As described in Section 9, the selected remedy will alleviate the potential risk to human health by reducing the potential for exposure to chromium by inhalation and cesium-137 by direct ionizing radiation. This action may not constitute the final remedy for the PBF Evaporation Pond, Corrosive Waste Sump, and the discharge pipe. However, the statutory preference for remedies employing treatment that reduces toxicity, mobility, or volume as the principal element, although partially addressed in this remedy, will be fully addressed at the time of the final response action.

10.2 Compliance with ARARS

The selected remedy will comply with the substantive requirements of all ARARs. A summary of the ARARs for this interim action is given in the following sections.

10.2.1 Chemical-Specific ARARS

The Clean Air Act establishes national standards and goals for air pollution control. The chemical-specific ARAR applicable to this interim action is 40 CFR 61.92, "National Emission Standards for Hazardous Air Pollutants [NESHAP], National Emission Standards for Radionuclide Emission from DOE facilities." This

applicable requirement specifies a limit of 10 mrem/yr for radiation exposures for the general public from ambient air concentrations of radionuclides.

Air emissions from the interim action facility will meet these standards. Based on current knowledge, there are no other chemical- or radionuclide-specific ARARs governing cleanup levels for the Evaporation Pond sediments, Corrosive Waste Sump, or discharge pipe.

10.2.2 Action Specific ARARs

- Applicable requirements of the rules for the "Control of Fugitive Dust," IDAPA 16.01.01251 and .01252 which specify that all reasonable precautions be taken to prevent the generation of fugitive dusts.

- Applicable requirements of 40 CFR 61.93, NESHAP, "Emission Monitoring and Testing Procedures," which contains monitoring requirements.

10.2.3 Location-Specific ARARs

There are no location-specific ARARs identified for this interim action.

10.2.4 Other Criteria, Advisories, or Guidance To-Be-Considered

Requirements under the Atomic Energy Act are applicable to the procurement, use, and disposal of all source, byproduct, and special nuclear material at the INEL. Although DOE Orders are not ARARs, since they are not promulgated requirements, all of the requirements of DOE Orders are to be considered. DOE Orders that may apply to this CERCLA activity include:

- DOE 5480.11, "Radiation Protection for Occupational Workers," establishes radionuclide-specific criteria to protect workers from hazard of exposure to ionizing radiation and radioactive materials.

- DOE 5820.2A, "Radioactive Waste Management," establishes standards for radiation exposure as follows:

  > . . . external exposure to the waste and concentration of radioactive material which may be released into surface water, groundwater, soil, plants, and animals which results in an effective dose equivalent that does not exceed 25 mrem/yr to any member of the public . . . and assures that the committed effective dose equivalents received by individuals who inadvertently may intrude into the facility after the loss of active institutional control (100 yrs) will not exceed 100 mrem/yr for a continuous exposure or 500 mrem/yr for a single acute exposure.

Removal of pond sediments and stabilization/solidification, as described, meets this standard for both the removed contaminants and the residual pond sediments.

11. DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for OU 5-13, interim action of the PBF Evaporation Pond and Corrosive Waste Sump was released for public comment in March 1992. The PBF Proposed Plan identified Alternative 2, removal of areas of high contaminant concentration, as the preferred alternative. Upon review of the cost estimates presented for the two disposal options in the Proposed Plan, the cost estimates were found to be low. The revised total cost for this interim action, Alternative 2, Option B, is $480,000. This change reflects the addition of the costs for: technical support, decontamination of the sump and discharge pipe, and assembling a tank to receive any

emergency discharge that may be necessary during the interim action. The increase in the cost estimates, which have changed from Table 2 of the Proposed Plan to the update in Table 3 of this ROD (Section 8.2.5), resulted from a review and revision of the assumptions used in developing the estimates. The adjustment is the same for both options presented for Alternative 2, and therefore, has no effect on the selected remedy.

The DOE, EPA, and IDHW have reviewed all written and verbal comments submitted during the public comment period. Upon review of these comments, it was determined no further significant changes to the remedy, as it was originally identified in the Proposed Plan, were necessary.

APPENDIX A
RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY

1.0 OVERVIEW

The proposed plan for an interim action remediation of the Power Burst Facility Corrosive Waste Sump and the Power Burst Facility Evaporation Pond was released to the public on March 19, 1992. The initial public comment period was scheduled from March 25 to April 24, 1992. Comments from the public on the proposed plan were sought by the Department of Energy, Environmental Protection Agency and State of Idaho to assist in their evaluation of the alternatives. Requests for extension of the comment period were received and granted, resulting in an extension until May 24, 1992.

The Federal Facility Agreement and Consent Order (FFA/CO) designates this site as Operable Unit (OU) 13 of Waste Area Group (WAG) 5. The FFA/CO identifies this site for investigation as an interim action. An interim action is the procedure used by the agencies to expedite action to eliminate, reduce, or control a current potential threat to human health and the environment that is posed by a site.

The proposed plan for cleanup discusses alternatives for the Corrosive Waste Sump, Evaporation Pond, and discharge pipe at the PBF facility. The proposed plan recommended Alternative 2, hot spot removal and requested comment on the two options presented for treatment and disposal.

2.0 BACKGROUND ON COMMUNITY INVOLVEMENT

The Notice of Availability for the proposed plan was published in the *Post Register* (Idaho Falls), *Idaho State Journal* (Pocatello) and *Times News* (Twin Falls) on April 3; in the *Idaho Statesman* (Boise) and *Daily News* (Moscow-Pullman) on March 21; in the *South Idaho Press* (Burley) on March 27 and April 3; and the Lewiston Morning Tribune on March 21.

An announcement of the extension to the public comment period was made in the *Post Register* on April 24, the *Idaho State Journal* on April 26, the *Times News* on April 26, the *Idaho Statesman* on April 27, the *Daily News* on April 24, the *South Idaho Press* on April 24, and the *Lewiston Morning Tribune* on April 26.

The Proposed Plan was mailed to 6,500 individuals on the INEL mailing list with a cover letter from the Director of the Environmental Restoration Division of the DOE Idaho Field Office, urging citizens to comment on the plan and to attend public meetings. Copies of the plan are available in the Administrative Record file at the INEL Technical Library, 1776 Science Center Drive, Idaho Falls. Copies of the file are also available in the INEL Information Repository section of public libraries in Idaho Falls, Pocatello, Twin Falls, Boise, and the University of Idaho Library in Moscow.

Public meetings were held on April 8 in Idaho Falls and April 9 in Burley. The dates, times and places for these meetings were announced in the Proposed Plan and the INEL News, which is distributed to approximately 14,000 members of the public. An INEL press release, distributed to statewide media, informed the public of upcoming meetings in their areas, and personal phone calls informed key individuals and groups of the opportunity for public comment.

At the meetings, representatives from the DOE, EPA and IDHW discussed the project, answered questions, and received public comment. Verbatim transcripts were prepared by a court reporter at each public meeting, and are available in the administrative record file.

A technical briefing was requested by the Moscow League of Women Voters for the citizens of Moscow.

A telephone briefing was conducted by the DOE on May 7, 1992 at the University of Idaho Education Building.

3.0 SUMMARY OF COMMENTS RECEIVED DURING PUBLIC COMMENT PERIOD

All verbal comments, as given at the public meetings, and all written comments, as submitted, are repeated verbatim in the Administrative Record for the ROD. The comments are annotated to indicate which response in this Responsiveness Summary addresses each comment. Responses to the comments received during the public comment period are included in this Responsiveness Summary, and were considered during development of the Record of Decision. Predominant public opinions on the preferred alternative, as described in the proposed plan, were (1) that it was too expensive, (2) that it was the better of the alternatives presented, (3) that all sediments contained in the Evaporation Pond should be removed, treated and disposed, (4) that the risk is not significant and no action should be taken, and (5) that additional alternatives should have been evaluated by the agencies and included in the Proposed Plan.

Comments and questions raised during the comment period are summarized in this Responsiveness Summary. Oral comments received at the public meetings and written comments submitted have been grouped according to the general subject of the comments.

Comments and questions on a variety of subjects not specific to the PBF Interim Action were also received. Comments directed specifically to an agency have been referred to that agency for consideration. Comments on public participation have been referred to the INEL Community Relations Plan Coordinator for consideration in the update of the INEL Community Relations Plan. General comments on INEL activities have been referred to the INEL Public Affairs Office. Additional information on these topics may be obtained from the INEL Public Affairs Office in Idaho Falls or at the local INEL offices in Pocatello, Twin Falls, and Boise.

4.0 SUMMARIZED COMMENTS ON THE PBF INTERIM ACTION

A comment tracking system has been utilized to aid the public in finding responses to individual comments on the proposed plan that were provided during the comment portion of the public meetings or submitted in writing. This system has been initiated by the Department of Energy to respond to public comments concerning Responsiveness Summaries and is intended to aid the public in reviewing the Record of Decision and the Responsiveness Summary. If you have any comments on this system or suggestions for improvement, please contact the INEL Community Relations Plan Coordinator at (208) 526-6864. This system is described below:

- During the comment period held on the proposed plan, the Department of Energy received over 100 pages of written and oral comments submitted by members of the public and public officials. From these pages, a number of common topics and questions emerge.

  To provide a manageable response to comments document for the public and the agencies, questions and comments with similar themes were condensed into a single comment or question with a response provided by the agencies. Immediately after each summarized comment, you will find a series of letters and numbers in parentheses. These are all the comments that were grouped together to create that particular summarized comment. This series of letters and numbers identify individual comments from the transcripts or written comments. The first two characters of each comment code identify which transcript, or written document the comment is found (transcript #1, Idaho Falls = "T1", written comment #1 = "W1"). The second set of numbers represents the sequence of individual comments in the document ("T1-1" is the first comment identified in the Idaho Falls transcript.)

  Each comment is identified by brackets, the comment code, and the response number to assist individuals in finding their comments and the corresponding responses. A set of indices is also provided that identifies comments by commentor name, comment code, response number, and the page number of the comment.

The bracketed transcripts and written comments are available for review in the Administrative Record file. Appendix B of the Record of Decision provides the index for cross referencing the Responsiveness Summary with the transcripts and written comments. Appendix C of the Record of Decision contains the Administrative Record index.

PBF RESPONSIVENESS SUMMARY

CHARACTERIZATION AND EXTENT OF THE INTERIM ACTION

(1) Comment: Why is this project being considered as an Interim Action? It is not a serious cleanup problem and action can be deferred awaiting the cleanup of more serious problems. (T1-11, W8-1)

Response: An interim action is undertaken to reduce an unacceptable risk and/or expedite overall site cleanup. For an interim action, EPA guidance allows for risk to be evaluated qualitatively. At the PBF Pond the chromium in the pond presents an unacceptable hazard from inhalation of dust. The most highly concentrated areas of cesium are also a possible health hazard due to ionizing radiation. Based on these two risk conditions, the three agencies determined that remediation of the pond was prudent, based on the available information. Remediation of areas of concentrated contamination was presented as the preferred alternative, due to the apparent concentration of contaminants in discrete zones within the lined area of the pond.

(2) Comment: Cesium and chromium, both known contaminants in the pond sediments, are Resource Conservation and Recovery Act (RCRA) hazardous waste. There is no indication as to whether RCRA standards are being met or whether the RCRA-contaminated materials will be disposed at a RCRA-permitted site. When the pond is closed, it should be done to meet RCRA standards. The proposed plan or supporting documents do not cite how Applicable or Relevant and Appropriate Requirements (ARARs) will be met. (T2-7, T2-11, W5-4, W6-7, W6-11, W7-6, W11-8, W11-13, W13-5, W13-9)

Response: For a material to be a RCRA waste, it must meet at least one of the following criteria:

1) Be listed in 40 CFR 261;
2) Be Characteristic (Reactive, Ignitable, Corrosive, or Exceed Toxicity Characteristic Leaching Procedure Standards); or
3) Be derived from or contained in a known RCRA waste.

Samples have been retrieved from the sediments and subjected to the EPA-required testing to determine if the tested materials were 'hazardous," as defined by RCRA. The results indicated that the material was not a RCRA hazardous waste, therefore, RCRA disposal and closure standards are not required. Additionally, radionuclides are regulated by the Atomic Energy Act and are specifically excluded from regulation under RCRA, except when they are a mixed waste.

This interim action is being taken to reduce immediate risks to human health and the environment from the PBF Evaporation Pond. Section 10 of the Record of Decision presents the ARARs for this interim action. Consistent with CERCLA and 40 CFR 430, other ARARs may be identified for the final action at this site.

(3) Comment: Cesium-137 (half-life of 30 years) seems to be a major concern. Why is there no mention of other radioactive isotopes that are normally present? (W8-2)

Response: The risks associated with cesium-137 were calculated using default exposure parameters and found to be within the National Contingency Plan acceptable risk range. The interim action will result in the removal of areas of higher concentrations of cesium-137 in the pond sediments by using it as an indicator for the presence of elevated levels of chromium, which presents an unacceptable risk.

Previous investigations, performed under the Consent Order and Compliance Agreement (COCA), evaluated only a limited number of analytes. However, gamma spectroscopy was performed on retrieved sediment samples. These analyses indicated the presence of one gamma emitting radionuclide (cesium-137) above background concentrations. Other radionuclides are present, but are at or below background levels. Adequate information on contamination in the PBF pond exists to support a qualitative evaluation of the risks and initiation of an interim remedial action. Following remedial activities, confirmatory sampling will be performed to verify that concentrations of contaminants of concern have been reduced to acceptable levels, based on risk.

(4) Comment: The chromates and the volatile organic compounds of 4-methyl, 2-pentanone, ethylbenzene, and xylene are not of great concern. One might consider biofiltration for disposal of the organics if they can be separated. See the "Chemical Engineering Process" April 1992 issue for more information. (W8-4)

Response: Volatile Organic Compounds (VOCs) were detected only in the sump, and were not found in concentrations which present an unacceptable risk to human health or the environment and therefore, removal of organic compounds is not considered necessary. The material removed from the sump will be treated by grouting if feasible based on treatability studies, and disposed of at the Radioactive Waste Management Complex (RWMC) at the INEL.

(5) Comment: One commentor commended the Department of Energy, Idaho Field Office (DOE-ID) for placing more background and technical information on the proposed plan in the Information Repository than has occurred in the past. This information included calibration data for instruments and technical information depicting greater usage of numbers in describing the problems and solutions. (W8-6)

Response: As a result of public comments, the agencies are trying to supply more detailed information into the Administrative Record to satisfy, but not overwhelm, the public. In the past the agencies have received comments on both too much information and not enough information.

(6) Comment: There are discrepancies between information offered in the proposed plan and DOE-ID contractor documents. For instance, the proposed plan cities: "The highest concentrations of cesium-137 (325 pCi/g) were at the pond inlet"; where as EG&G-WM-8804 cites: "Specific concentrations ranged from a high of 830 pCi/g for a surface sediment sample collected adjacent to the drip pan to a low of 15.2 pCi/g collected diagonally across the pond from the drip pan. Radiological Release Criteria specify a limit of 10 pCi/g for release of soils contaminated by cesium-137." (W7-4, W11-5, W13-3)

Response: The 325 pCi/g concentration of cesium-137 represents the average of the highest concentration sampled in each of the 19 sample grids. Grid averages were determined by combining 5 individual samples taken from within a grid. The 830 pCi/g concentration represents the highest concentration of an individual sample within a grid. The 15.2 pCi/g concentration represents the lowest concentration from a sample within the grid. Average concentrations over a sample grid were used in the proposed plan because they more accurately reflect concentrations in the pond sediments as a whole. Sampling results were used to develop a preliminary risk evaluation for the PBF Evaporation Pond, in accordance with EPA guidance. Based on input of these data into the risk evaluation, it was determined that the proposed remedial action of removal of areas of concentrated contamination would be prudent. This interim action is conducted under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) on a risk-based approach. The use of averages versus individual sample values for expressing the highest concentration detected has no impact on the results of the risk evaluation.

(7) Comment: The PBF Interim Action Plan is inadequate. It has extremely poor analysis, planning, and the survey data is incomplete or totally lacking. It should be rewritten to provide a more complete, comparative analysis of other feasible options. This is an example of how the agencies deny the public access to information they need to exercise their rights to participate in the public participation process on Superfund projects. (T1-14, T2-1, W6-1, W11-1, W12-1)

Response: The proposed plan was prepared by DOE-ID, with the involvement and concurrence of the EPA and the Idaho Department of Health and Welfare. This proposed plan is a community relations document that presents a summary of the more detailed information available in the Administrative Record. Documents supporting the proposed plan are available in the Administrative Record. The Proposed Plan presents an overview of the information that was used to develop cleanup alternatives, outlines those alternatives, and identifies the alternative preferred by the agencies. Please visit one of the Information Repositories listed in the Proposed Plan for more information on this project. The agencies welcome public comments on how to better present information to the public and will take these comments into consideration when preparing future proposed plans.

(8) Comment: Air samples have not been collected and analyzed for chromium, and information on radiation exposure levels are not presented in the proposal. The hot spots to be removed are not defined, they are relative numbers. The levels of acceptable residual contamination should be defined. In addition, there is no evidence of quality control, such as split sample data. All the public is getting is DOE-ID information and data. (T1-7, T2-10, W6-10, W12-2)

Response: When an unacceptable risk is present and can be clearly defined, an interim remedial action may be initiated to reduce that risk. It is not required by CERCLA that a site/source be fully characterized, if the agencies involved determine that an unacceptable risk is presently affecting, or has the potential to adversely impact, human health or the environment. Although full characterization data does not exist, sufficient data are available to demonstrate an unacceptable risk from the contamination in the pond sediments. This Operable Unit will be re-evaluated by the three agencies during the final WAG 5 Remedial Investigation to determine the effectiveness of this interim action.

To define acceptable residual contamination levels, acceptable remediation goals or clean-up levels are determined and defined in the Record of Decision. These goals or levels include criteria for the selection of areas of concentrated contamination to be removed, and are presented in Section 9.3 of the Record of Decision.

The sampling of PBF sediments occurred under the terms of Consent Order and Compliance Agreement, and split sampling data were not required. The data have been evaluated in accordance with EPA data validation protocols. The data validation process is an encompassing review of sampling techniques, handling procedures and analytic protocols.

(9) Comment: If the purpose of the sampling was to determine hot spots, why were 19 sediment samples collected from the pond without obtaining a radiation survey of the work area? (W12-3)

Response:
The previous sediment sampling was performed to determine the nature and extent of suspected contamination within the pond sediments. Results of this sampling indicated a correlation between two contaminants of concern, chromium and cesium, and provide sufficient information to select the preferred alternative.

(10) Comment: Based on the data presented, removal of the hot spots will recover about 15 to 20 percent of the chromium and about 40 percent of the cesium-137. The proposed plan does not produce any estimates on the percent reduction expected by the proposed"expedited cleanup to control a current potential threat." (W12-4)

Response: In accordance with CERCLA, the proposed plan for this action does not establish cleanup levels. It presents alternatives to reduce an unacceptable risk to the public for evaluation and comment.

Clean-up levels have been established in this Record of Decision for both carcinogenic risk and noncarcinogenic hazards; the clean-up levels are 800 mg/kg for chromium and 30 pCi/g for cesium-137. By implementing this action contamination will be reduced to acceptable risk levels as determined by the National Contingency Plan.

RISK ASSESSMENT

(11) Comment: While the proposed plan states that present levels of contamination may be detrimental, no health or environmental risk has been quantified. The public needs information regarding the amount of risk reduction to be achieved by each option or alternative. (T1-5, W12-8)

Response: In accordance with the National Contingency Plan, an interim action may be initiated if a qualitative evaluation indicates excessive risk to human health or the environment. However, based on the information in the Administrative Record and application of EPA Region 10 Default Risk Scenarios, it was determined that the pond presents an unacceptable risk to present-day workers as well as future residents at the PBF. The no action alternative will not effectively reduce the identified risk, whereas removal of areas of concentrated contamination will.

(12) Comment: The proposed plan states that the risks posed to workers and the general public during the implementation of any of the alternatives, including the no action alternative, would be very small. Therefore, in comparison to the risk to the workers, the risk to the public must be much lower and most likely nonexistent. (T1-6)

Response: The action was initiated based on current risk to workers, but cleanup goals were set to protect both workers and future residents. The current risk to the public is much lower than that to the workers because public access to the PBF area is restricted, and the exposure time for public visits to the site is much less than the typical worker's time on the site.

AGENCY ROLES AND REGULATIONS

(13) Comment: The no action alternative is not a legal alternative. Therefore, the EPA should not condone a public meeting that solicits comments on a no action alternative and presents the real alternatives as options. (W11-4)

Response: The no action alternative is specifically required to be evaluated in all proposed plans under CERCLA (40 CFR 300.430). If the no action alternative meets threshold criteria (is protective of human health and the environment and complies with ARARs), then no further analysis (and no cleanup under CERCLA) would be required.

PUBLIC INVOLVEMENT

(14) Comment: It was requested that the public comment period on the proposed plan for the Interim Action at PBF be extended 30 days to May 24, 1992. (W1-1, W1-2, W2-1, W3-1, W4-1)

Response: The public comment period was extended 30 days and ended May 24, 1992.

(15) Comment: Because the agencies did not schedule a public meeting in Moscow, a technical briefing was requested at least 20 days prior to the end of the extended comment period. It was also requested that this meeting be taped so the DOE-ID Idaho Field Office could be held accountable for information presented. (W1-3, W2-3, W3-2)

Response: A technical briefing was held with the citizens of Moscow on May 7, 1992 by telephone. The meeting was a technical exchange of information and was not taped.

(16) Comment: Proposed plans should have at least two alternatives that meet the nine National Contingency Plan criteria. The no action alternative should not be considered as a viable alternative because it does not meet the nine National Contingency Plan criteria. Community acceptance cannot be obtained on proposed plans that

have not identified all viable alternatives for review and consideration by the public. (W9-1, W10-1, W11-2, W13-1)

Response: Consistent with the National Contingency Plan and EPA guidance, a limited number of alternatives were evaluated for this interim action. The alternatives and options as presented in the proposed plan were developed jointly by the three agencies and determined to be most consistent with the objectives of this interim remedial action. If during the public comment period, other alternatives are introduced by the public, the agencies will consider these during the decision-making process. (See also, response to comment #13)

This interim action and others like it will be reviewed in their respective WAG-Wide Remedial Investigations, and the adequacy of the action as a final action will be addressed. The final action for this operable unit will be presented for public comment following the completion of the comprehensive WAG 5 Remedial Investigation and Feasibility Study.

GENERAL COMMENTS ON ALTERNATIVES

(17) Comment: Neither proposed option is an acceptable permanent solution. (T2-6, W6-6, W10-5)

Response: The preferred alternative meets the nine evaluation criteria required by CERCLA. The purpose of this interim action is to reduce the risk presented by pond sediments and will effectively meet this goal. The adequacy of this interim action as a final action will be evaluated as part of the comprehensive WAG 5 Remedial Investigation, which will be available for public comment. Interim actions are implemented as a permanent solution when possible and are not inconsistent with any planned future actions.

(18) Comment: Various commentors thanked the agencies for conducting the interim action on the PBF Evaporation Pond and showing so much concern about what one small pond in the middle of the desert might do to people in the surrounding area. (T1-1, T1-2)

Response: The expedited cleanup of contaminated sites which present an unacceptable risk to human health and the environment at the INEL is the objective of the agencies.

(19) Comment: There wasn't enough information disseminated on how the contaminants would be removed. (T1-15)

Response: Once the remedy has been selected, a specific process for removing the contaminated sediments from the pond will be developed during the Remedial Design/Remedial Action phase of the project. This information will be included in the Information Repository following concurrence between the agencies on the Remedial Design/Remedial Action phase of the project.

(20) Comment: Hot spot removal options A and B should have been identified as alternatives 2 and 3. An analysis of these alternatives would provide the public with the opportunity to evaluate two viable alternatives. (W7-1, W11-3, W13-2)

Response: This alternative was presented as removal of areas of concentrated contamination with two treatment options, as public comments received in the past on other proposed plans have stated that two alternatives that differ only in treatment mechanism should be presented together as options under the same alternative. Public comments will continue to be considered in determining how to best present the information contained in proposed plans to the public.

(21) Comment: The DOE Idaho Field Office intends to pursue hot spot removal regardless of any public input. (W10-2)

Response: Removal of areas of concentrated contamination was the preferred alternative of DOE-ID, EPA, and IDHW in the proposed plan and represented consensus opinion based on what is known about the site. EPA guidance requires that the agencies present a preferred alternative to the public for comment. Public comment is solicited to ensure other information about the site, a cleanup process, or a public concern have not been overlooked. A final decision on the alternative is not made until the public comment period has closed and public comments have been considered by the three agencies.

(22) Comment: Table 1 on page 6 of the proposed plan does not accurately present the comparative analysis. How can alternative 2 be more cost effective than alternative 1? This is a comparison of over $300,000 to $0. Shouldn't the symbols be reversed? Also "Reduction of Toxicity" and "Implementability" cannot be rated "Best" for alternative 2. Maybe they could be rated "Good." A five gradation system, instead of the current three, used for comparison of the Alternatives Table would be more objective. (W12-9)

Response: The no action alternative is not cost effective, as it does not reduce the identified risk, which is the purposes of this interim action. Alternative 2 was determined to be more cost effective than Alternative 1 (no action) because the removal of areas of concentrated contamination would reduce the risk to acceptable levels. Alternatives are compared to the criteria, and then a comparative analysis of each alternative to the specific criteria (RI/FS Guidance 6.2.5 and OSWER Directive 9355.3-2 Section 2.3.6). These ratings are not absolute and are for comparative purposes to aid in the evaluation of cleanup alternatives.

ALTERNATIVE #1

Comments on Alternative #1 have been addressed elsewhere. See comments number 13 and 17.

ALTERNATIVE #2

(23) Comment: If the only options being considered are those presented in the proposed plan, Option B should be chosen because it is cheaper, more easily implemented, will result in less exposure, and is a proven technology. Option B would also save at least $80,000 as compared to soil washing. Soil washing is more complex and would require the use of a planned treatment plant which may contain hidden costs and problems. (T1-13, W12-11)

Response: The factors listed above were considered in selecting the remedy (Alternative 2, with Option B) for the interim action, as documented in the Record of Decision. See Section 8 of the Record of Decision for the comparative analysis of the alternatives.

(24) Comment: Hot spot removal is such a simplistic approach that it is inadequate and unworthy of fair evaluation. (T1-9)

Response: Removal of areas of concentrated contamination was chosen by the three agencies as the preferred alternative because it efficiently reduces the risk to human health and the environment. An alternative is not eliminated on the basis of simplicity. Alternatives are evaluated against the nine criteria specified in the National Contingency Plan as well as site-specific considerations. The removal of areas of concentrated contamination meets the threshold criteria, the balancing criteria, and the modifying criteria established in the National Contingency Plan for evaluation of remedial action alternatives. It also best fits the site-specific requirements for the PBF Evaporation Pond.

(25) Comment: Alternative 2 is lacking in that only the hot spots would be removed and the regulators could walk away from the rest of the problem. The difference between an interim action and final action is not clear. (T2-5, W6-5, W7-5)

Response: The interim action is designed to reduce the worker's immediate risk to acceptable levels. For this

interim action, cleanup levels were established to be protective of possible future residents at the PBF, as well as current workers. The effectiveness of the interim action as a final action will be evaluated during the comprehensive WAG 5 RI/FS, scheduled to begin in 1996.

(26) Comment: Hot spot cleanup is definitely the most logical choice. (W8-3)

Response: This alternative was considered the most cost-effective and efficient method to reduce the risk and minimize the quantity of waste generated.

(27) Comment: The grouting option is not a long-term solution for this waste. Grouting is weak, susceptible to water damage and will degrade over time. (T2-8, W6-8)

Response: A series of tests will be performed to ensure that the grouted material behaves as anticipated. This segment of the remedial project, known as 'Remedial Design/Remedial Action," will document the studies performed and their outcomes. Further, the option of grouting RWMC Certified Waste Containers has been previously evaluated and results of that testing program have been included in the Administrative Record.

(28) Comment: The hot spot removal and chromate separation is favored only if: (1) the separation cleanup occurs only at the site, (2) the separation facilities be made portable (movable on trucks) so they can be used elsewhere for similar problems. (3) the technology be made available to the public for use elsewhere at minimal cost, and (4) the detailed records of costs and designs be kept and also made available. (W8-5)

Response: Option A, as presented in the proposed plan, if implemented would have occurred at the INEL at the proposed facility for the Test Reactor Area (TRA) Warm Waste Pond sediments. Although this proposed facility will not be mobile, it was evaluated as a possible treatment process for the PBF Pond sediments because it would allow the proposed facility to be used on more than one project. The physical/chemical separation process proposed at TRA is based on similar technologies used by industry for different contaminants. More detailed cost and design information will be made available as the remedial design/remedial action progresses.

(29) Comment: Grout testing conducted at Oak Ridge National Laboratory concluded that the grouted boxes had problems with considerable air voids, lack of structural integrity, and extensive cracking of the grout. Additionally, the study stated that unless the outside and inside of the containers were grouted, the subsidence problem would not be mitigated. (W7-7, W11-14, W13-10)

Response: The Administrative Record contains a study of grout mixtures in waste boxes that was performed at the RWMC in which some of these problems were satisfactorily addressed. The waste containers have been upgraded to better contain the grout mix. During this interim action a treatability study will be performed to demonstrate the effectiveness of the technology for the PBF pond sediments, prior to full scale implementation.

(30) Comment: The hot spot removal alternative is inappropriate as the cleanup may violate the integrity of the hypalon liner, would leave contaminated sediments in the pond that may have to be removed later, and would generate hazardous waste to be disposed in a manner that does not meet RCRA standards. If contamination is found under the liner, then it should be removed as part of this action. (T1-12, T2-3, W6-3, W10-3, W10-4, W11-7, W13-4)

Response: The remedial action taken will be designed to minimize the probability of puncturing the liner. If the liner is breached during removal of sediments it will be repaired, replaced, or other options considered, as is appropriate. Sediments left in the pond may be considered contaminated, but are not expected to present an unacceptable risk to human health or the environment following remedial activities. It is not anticipated that the removal of sediments from the Evaporation Pond will create a RCRA 'hazardous" waste, (that is, a material that meets the RCRA definition of 'hazardous" as given above in the response to comment #2). If, however, the contaminated sediment removed was determined to be a RCRA waste, it would be handled as such. As stated in

the Proposed Plan, remediation of the PBF pond will include evaluation of the sub-liner material. Remediation will occur if contamination is found above the cleanup levels documented in the Record of Decision.

(31) Comment: Burial at RWMC is opposed. Contaminated wastes should be buried at fully licensed, permitted RCRA sites. (W11-15, W13-11)

Response: The proposed removed/grouted sediments are not RCRA hazardous waste based on 1989 sampling information. Therefore, disposal at a RCRA facility is not warranted. The sediments will be grouted and then disposed of at the RWMC low-level radioactive waste repository in compliance with applicable laws.

(32) Comment: Contaminated materials should be sent to TRA for soil washing. A new, fully lined evaporation pond should be built at TRA to receive the water from all soil washing processes, and all retrieved wastes disposed at a licensed, permitted RCRA site. Contaminated water placed in the evaporation pond should be treated to meet drinking-water standards. (W10-7, W11-12, W13-8)

Response: Option A was not selected after performing the comparative analysis of the alternatives. (see Section 8 of the Record of Decision) In the comparison of options A and B, Option B was more implementable. If the TRA (Option A) had been selected, this interim action would also comply with the requirements of the TRA Warm Waste Pond Record of Decision. There is no requirement to treat the water placed in the TRA evaporation pond to drinking water standards, nor to dispose of non-RCRA waste at a RCRA facility.

OTHER ALTERNATIVES

(33) Comment: Consider using a grout form and putting it in a retrievable, above ground area where it could be accessed, neutralized and disposed of later (in a modern, treatable, storage facility). Perhaps the containers could be changed every 40 to 50 years. (T2-9, W6-9, W6-13)

Response: The permitted disposal method for low-level waste on the INEL is to place it in the low-level waste repository at the RWMC.

(34) Comment: Alternatives that need to be considered include backfilling the pond with clean dirt and capping, or treating with a surfactant for dust control and fencing to provide adequate distance to reduce radiation exposure. The capping alternative was evaluated for the TRA Warm Waste Pond Cleanup and found to meet environmental laws. Capping was also determined to be superior for implementability, cost, and reduction of risk to both workers and the general public from inhalation or direct exposure. (T1-10, W5-1, W5-3, W5-6, W12-7)

Response: The agencies considered various other alternatives during the preparation of the proposed plan. Filling the pond with dirt and capping was not further considered because of the possible need for future use of the pond. Treating the pond with a surfactant for dust control and fencing is not a long term solution. Currently, water is kept on the pond to control dust and a 6-ft high cyclone fence has been in place around the entire perimeter of the evaporation pond since its construction. Removal of sediment within the pond where the contaminants are concentrated best meets the majority of the criteria as specified in the National Contingency Plan and the site specific considerations for this operable unit.

(35) Comment: Hot spots in the evaporation pond could be in-situ treated by stabilization using cement applied through vertical mixing. (W5-2)

Response: This method would be more costly and would expose the existing liner to much greater potential for damage and subsequent leakage than the selected interim action. It would also preclude further use of the pond, which was a consideration in developing the alternatives. Also, consolidating the material at an existing controlled area is preferred because it reduces requirements and cost of managing access.

(36) Comment: Alternatives such as capping, stabilization or surfactant treatment should be considered because: there would not be any operational impacts at the facility, the contamination was found at the top of Hypalon liner and there is not a need to remove the contamination, only a need to prevent the contamination from entering the air to reduce radiation exposure. These alternatives would reduce exposure from inhalation and direct ionizing radiation, comply with RCRA, are less costly, and would protect human health and the environment. (W5-5)

Response: These alternatives were eliminated from consideration because of site specific needs for the future use of the pond or they did not provide a long-term solution. The alternative selected was evaluated for protection of human health and the environment, cost effectiveness, compliance with ARARs and other National Contingency Plan evaluation criteria, and found to best meet these criteria. Remedial project goals have been established by the agencies following the guidance in Risk Assessment Guidance for Superfund, Part A or B. The risk-based cleanup level for chromium is 800 mg/kg, while the cleanup level for cesium-137 has been set at 30 pCi/g. (See also, response to comment #34)

(37) Comment: The lowest concentration of cesium-137 was 15.2 pCi/g as reported in EG&G-WM-8804. This further supports removal of all sediments. (W11-6)

Response: This interim action was undertaken to reduce an unacceptable risk from chromium inhalation. The clean-up level for chromium in the PBF pond is 800 mg/kg. The clean-up level for cesium-137 is 30 pCi/g is readily detected using field screening methods. The detection of cesium will be used to determine where the contaminants are likely concentrated in the pond sediments and aid in the removal of the chromium. The cesium-137 concentration of 15.2 pCi/g reported does not support removal of all sediments as it does not present an unacceptable risk under either of the risk scenarios evaluated.

(38) Comment: A third alternative is to remove all of the contaminated material on top of the hypalon liner. Monitoring devices should be installed and additional testing conducted during the remedial action to determine if the hypalon liner is intact. If contamination exists below the liner in excess of Radiological Release Criteria and/ or other acceptable concentrations of hazardous materials, then this soil should also be removed. Tests for strontium 90 and iodine should also be done. This third alternative is preferred over the others because hot spot removal would inevitably compromise the liner, thereby providing contamination routes for other contaminants in the pond; and the concentration levels in the whole pond warrant complete removal. The soils beneath the liner should also be treated to prevent further migration of contaminants into the soil and aquifer. (T2-2, W5-7, W6-02, W7-2, W10-8, W11-9, W11-11, W13-6)

Response: An evaluation of the risk presented by the chromium and cesium in the pond indicate that only areas of concentrated contamination in the sediments require removal in order to decrease the immediate risk to an acceptable level. Removal of all sediments is not dictated by either the anticipated risk or the interim action. Visual observations and staff gage recordings of water levels are currently employed, along with a review of discharge and meteorologic information, to monitor liner integrity. Analysis of the soils beneath the liner will be performed as a part of this interim action. If contamination is present at concentrations greater than the cleanup levels, the contaminated soil will also be removed. The need for evaluation for strontium and iodine was not indicated during the review of operational processes at PBF, and these radionuclides are not presently known or expected to be contaminants of concern at this operable unit. The method chosen for removal of areas of concentrated contamination will be designed to minimize the impact on the existing liner, and if the liner is compromised it will be repaired, replaced, or other options considered, as appropriate.

(39) Comment: DOE-ID should leave a water barrier over the PBF Evaporation Pond until it is fully committed to restoring this operable unit in its entirety to health based standards and RCRA criteria. (W10-6)

Response: DOE-ID has placed a water barrier over the pond sediments at the recommendation of an audit team, to mitigate the risk until this interim action is implemented. This interim action has been undertaken to remove the unacceptable risk associated with the pond sediments.

The 1989 EP Toxicity tests show that the Evaporation Pond sediments do not exhibit the toxicity characteristic for chromium, and therefore are not RCRA hazardous. The final action for this operable unit will meet the substantive requirements of RCRA in the event that an unacceptable risk is identified during the WAG-wide Remedial Investigation.

COSTS, BUDGETS, AND SCHEDULES

(40) Comment: The estimated cost of this Interim Action is $300,000 - $400,000. A commentor regarded the decision as a political choice and not based on technical data. Is it a cost-effective use of taxpayer money to spend this amount to reduce an imagined threat by 15 to 40 percent? (T1-4, T1-8, W12-5)

Response: The need to perform a remedial action is based on the presence of an unacceptable risk as discussed in Section 6 of the Record of Decision. If an unacceptable risk exists, DOE-ID is obligated under CERCLA to take action to reduce that risk. Therefore, the choice to perform an action is a legal requirement, not a political choice. Once unacceptable risks are identified, the CERCLA process sets forth criteria for evaluating alternatives to reduce those risks. One criterion in that evaluation is cost effectiveness. The agencies consider cost effectiveness an important factor in evaluating alternatives. Alternatives must be evaluated for their ability to reduce unacceptable risks to within the target risk range.

(41) Comment: Considerable cost savings could be achieved with one comprehensive clean-up operation, as opposed to numerous operational set-ups and tear-downs. It will be cheaper in the long run to remove all the sediments from the pond and do it right the first time. (T2-4, W6-4, W7-3, W11-10, W13-7)

Response: The need to balance cost effectiveness with risk reduction is important. For the PBF interim action, it was determined that pond sediments pose sufficient risk to warrant an interim action to reduce those risks. One requirement of an interim action is to ensure that actions taken to reduce risks in the short term do not compromise DOE-ID's ability to implement a long-term remedy. It is possible that the selected interim action may become the final remedy for the PBF sediments. This will be determined during the Waste Area Group 5 comprehensive Remedial Investigation/Feasibility Study.

(42) Comment: Traditionally, the rule of thumb on decontamination was that any reduction of less than 90% was not worth the costs and risks involved. However, at the public hearing one staff member said on the record that "any cleanup is better than no cleanup." I doubt that this person would use that philosophy with his own property and money. (W12-6)

Response: This condition was part of the incomplete quote cited in the comment, "If an unacceptable risk is identified, any cleanup is better than no cleanup." Remedial actions being conducted under the requirements of CERCLA must reduce risks identified at a site. Interim actions may result in less than a complete cleanup, but in the interest of efficiency and cost effectiveness, this action has established cleanup levels which should reduce the identified contaminants to an acceptable risk based level. Once the determination has been made that a site at the INEL poses an unacceptable risk, an evaluation on how to manage that risk must be performed. In this regard, an action to address unacceptable risks is required. (See also, response to comment #40)

(43) Comment: Using only three significant figures in your cost estimates is an improvement over the four and five figures used in earlier plans. Wouldn't two significant figures be more honest for early cost estimates? (W12-10)

Response: Depending on what is known about the site with regard to the level of confidence in characterization, the anticipated remedial procedure, and the overall remediation cost, the number of significant figures will vary. The agencies recognize and emphasize the need to ensure that data presented is accurate and significant.

OTHER RELATED COMMENTS

(44) Comment: In the Interim Action for the Warm Waste Pond Sediments at TRA, the wastes are not disposed of but only stored after separation and extraction from the sediments. This proposed plan does not address how the removed contaminants will be stored or disposed of. This particular point needs to be addressed in the Record of Decision. (W5-8)

Response: If the decision was made to use the proposed TRA process, then disposal/storage would be the same as for the Warm Waste Pond sediments, as similar contaminants are involved. The specific storage/disposal methods are determined during the remedial design phase of cleanup actions, in compliance with CERCLA and the National Contingency Plan.

(45) Comment: It's unfortunate that the DOE-ID has decided that, quote, "The future use of the PBF reactor is not anticipated." This is another bureaucratic rejection of the Boron/Neutron Capture Therapy (BNCT) project which, in one month, could prevent more cancer deaths than any impacts from the INEL from now until eternity even if no cleanup action was ever taken. (T1-3)

Response: Operational decisions are not within the jurisdiction of CERCLA or the FFA/CO, and the existence of the FFA/CO does not influence DOE-ID decisions regarding operations. The CERCLA removal of the contaminated sediments from the PBF Evaporation Pond did not influence the operational decision to shut down the BNCT research at the PBF reactor.

(46) Comment: The word "permanent" should be removed from the database for developing cleanup proposals, and the replaced by the actual number of years it will take to extract and safely contain the material. (W6-12)

Response: Each alternative is required to be evaluated for long-term effectiveness and permanence. This evaluation focuses on the extent and effectiveness of the controls that may be required to manage the risk posed by treatment residuals and/or untreated wastes. Since the term permanent is in the statute and it is not otherwise defined, the dictionary definition was used. Permanent is defined as "continuing or enduring without fundamental or marked change: Stable." The alternatives presented in the Proposed Plan were considered to provide a long-term solution which would be stable or permanent. The length of time to remove the sediments from the pond will be determined during remedial design, however, the actual removal is anticipated to take up to several months. The material will then be stabilized and containerized in accordance with applicable regulations, followed by disposal at the RWMC.

(47) Comment: Why isn't the PBF Evaporation Pond a permitted RCRA land disposal site or listed as an Idaho Hazardous Waste Management Act (HWMA) site? (W7-8)

Response: The PBF Evaporation Pond is not a permitted RCRA disposal site as it does not currently receive RCRA waste. The site was previously listed under the Consent Order and Compliance Agreement (COCA) as a RCRA Land Disposal Unit (LDU). Under that agreement, the sump and pond were listed as COCA units PBF-08 and PBF-10, respectively. In December 1991, the DOE, EPA, and IDHW signed a Federal Facility Agreement and Consent Order (FFA/CO) which supersedes the COCA. Under the FFA/CO, sites that present an unacceptable risk to human health or the environment require remediation under CERCLA and in accordance with RCRA and the State of Idaho HWMA.

APPENDIX B

PUBLIC COMMENT/RESPONSE LIST INDEX

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Walter E. Bentley	W8-5	72	L	28
Walter E. Bentley	W8-6	72	L	05
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Chuck Broscious	W7-1	66	L	20
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Carolyn Hondo	T2-1	56	R	07
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John Horan	T1-7	26	L	08
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John Horan	T1-13	27	L	23
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Appendix C

ADMINISTRATIVE RECORD INDEX

IDAHO NATIONAL ENGINEERING LABORATORY
ADMINISTRATIVE RECORD FILE INDEX

INTERIM ACTION FOR THE POWER BURST FACILITY (PBF)
CORROSIVE WASTE SUMP AND EVAPORATION POND
OPERABLE UNIT 5-13

FILE NUMBER

AR1.1 BACKGROUND

- Document #: EDF-263
  Title: Small Scale Soil Grout Test Report
  Author: Miller, C. L.
  Recipient: N/A
  Date: 09/29/86

- Document #: ST-CS-035-89
  Title: Radiological Analysis of PBF Evaporation Pond Samples
  Author: Casey, C.
  Recipient: N/A
  Date: 12/01/89

AR3.1 SAMPLING AND ANALYSIS PLANS (SAP)

- Document #: EGG-WM-8804
  Title: Phase I Sampling and Analysis Plan for the PBF Evaporation Pond and Waste Sump (COCA Units PBF-08 and PBF-10)
  Author: Hardy, C. K.
  Recipient: N/A
  Date: 12/01/89

- Document #: 5168
  Title: Section 4, Sampling and Analysis Program, from Report No. EGG-WM-8996, Closure Plan for the Power Burst Facility
  Author: Ludi, K. M.
  Recipient: N/A
  Date: 05/01/90

AR3.8 RISK ASSESSMENTS

- Document #: 5077
  Title: Preliminary Risk Assessment of the PBF-08 and PBF-10 Sump and Evaporation Pond
  Author: Stanisich, N.
  Recipient: N/A
  Date: 03/01/92

PBF CORROSIVE WASTE SUMP AND EVAPORATION POND
10/26/92

FILE NUMBER

AR4.3 PROPOSED PLAN

- Document #: ERP-92-199
  Title: Interim Action Proposed Plan for PBF-10 Cost Estimate
  Author: Parker, A. M.
  Recipient: Williams, A. C.
  Date: 03/13/92

AR4.2 FS REPORT

- Document #: EGG-WM-10000
  Title: Test Reactor Area Warm Waste Pond at the INEL Sediment Treatability Study Phase I Report
  Author: Beller, J. M.
  Recipient: N/A
  Date: 11/01/91

AR5.1 RECORD OF DECISION

- Document #: 3320
  Title: Declaration for the Warm Waste Pond at the TRA at the INEL Declaration of the Record of Decision
  Author: Baumer, A. R.
  Recipient: N/A
  Date: 12/05/91

- Document #: 5204
  Title: Declaration of the Record of Decision for the Power Burst Facility (PBF) Corrosive Waste Sump and Evaporation Pond
  Author: INEL Community Relations
  Recipient: N/A
  Date: 10/01/92

AR6.1 COOPERATIVE AGREEMENTS

- Document #: ERD1-070-91*
  Title: Pre-signature Implementation of the CERCLA Interagency Agreement Action Plan
  Author: EPA, Findley, C. E.
  Recipient: DOE, Solecki, J. E.
  Date: 04/19/91

FILE NUMBER

AR6.1 **COOPERATIVE AGREEMENTS** (continued)

- Document #: 3205*
  Title: U.S. DOE INEL Federal Facility Agreement and Consent Order
  Author: N/A
  Recipient: N/A
  Date: 07/22/91

- Document #: 1088-06-29-120*
  Title: U.S. DOE INEL Federal Facility Agreement and Consent Order
  Author: N/A
  Recipient: N/A
  Date: 12/04/91

- Document #: 2919*
  Title: INEL Action Plan For Implementation of the Federal Facility Agreement and Consent Order
  Author: N/A
  Recipient: N/A
  Date: 07/22/91

- Document #: 3298*
  Title: Response to Comments on the Idaho National Engineering Laboratory Federal Facility Agreement and Consent Order
  Author: N/A
  Recipient: N/A
  Date: 02/21/92

- Document #: 5163*
  Title: Administrative Record List of Guidance Documents
  Author: EPA
  Recipient: N/A
  Date: 08/12/92

AR10.3 **PUBLIC PARTICIPATION**

- Document #: 5167
  Title: Citizens are asked to comment on a Cleanup Project at the INEL
  Author: INEL Community Relations
  Recipient: N/A
  Date: 04/04/92

PBF CORROSIVE WASTE SUMP AND EVAPORATION POND
10/26/92

FILE NUMBER

AR10.4 PUBLIC MEETING TRANSCRIPTS

- Document #: 5122
  Title: Transcripts - Idaho Falls and Burley Public Meeting, Proposed Plan for the Power Burst Facility (PBF) Corrosive Waste Sump and Evaporation Pond
  Author: Public
  Recipient: N/A
  Date: 04/08/92

AR10.6 FACT SHEETS AND PRESS RELEASES

- Document #: 5076
  Title: Dear Citizen Pamphlet (Proposed Plan included in Pamphlet)
  Author: N/A
  Recipient: N/A
  Date: 03/19/92

- Document #: 5166
  Title: Comment Period Extended on the Proposed Plan
  Author: N/A
  Recipient: N/A
  Date: 04/01/92

* **Document filed in INEL Federal Facility Agreement and Consent Order (FFA/CO) Administrative Record Binder**